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PLUCKING, PRUNING AND PREPARATION OF TEA.

THE "*CEYLON OBSERVER*" PAMPHLET OF 1897 ON THE ABOVE SUBJECT.

(By "1874.")

I HAVE gone through this pamphlet again with much interest. I am at present going in for the subject of Pruning and referred to it to try and get some authority for my views. The pamphlet consists of opinions from 84 planters and comments on the letters by the editor. It contains a great mass of information. It would enable a proprietor, visiting his estates, who had no special knowledge of tea, to put shrewd questions to his managers, and ask them to give reasons for the line of action they had adopted. I think that it was unfortunate that the questions were put so as to show the influence of the three P's of the heading, on the fall in prices.

The 6th and 7th questions on the list are for "any other causes *apart* from Overproduction." Surely the range of prices depends *entirely* on the relation between demand and supply. In 1876 my manager made some "blackened" red leaf and got 10 annas for it. The red leaf was blackened by being steeped in ink. The ink was made by boiling hard tea leaves in iron pans. Yet we got 10 annas and the stuff could only be called *tea* because it appeared to be tea. Would it be too much to ask you to re-open the ballot, as applied to each question in turn, and leaving out its relation to average prices?

I should like to start the question of "Pruning." From your pamphlet I see that the general opinion says that "cutting down" reduces the value of the made tea, until the bushes have begun to get well covered. Some planters condemn cutting down but a large number say that it is necessary at intervals. This is the very point I wish to question. Letter No. 13 from "Hantane" says: "(3) Severe pruning, I have no experience of. I don't prune severely but often, every 12 months or so. The estate is old, the soil poor, but it is liberally manured and pruners are kept at work steadily all the year round. The result as far as I can yet judge has been wholly beneficial, no falling-off in the teas, and good plucking averages all the year round." That was three years ago; it would be interesting to know whether the same system has been carried on up to date. There is only one alternative for cutting down or cutting back and that is to cut out all old and useless wood each time the bush is pruned. The planter quoted above, does not say for how long he has refrained from cutting down, and so his support loses nearly all its value for my contention that "cutting down" *can* be entirely dispensed with if the bush is pruned properly each time it undergoes the knife. By "properly" I mean that all the good yielding branches shall be cut back as far as is judged necessary, but all old branches which have ceased to yield should be removed from the bush so that new branches may take their place. I can say that I have cut down only five acres within the last 10 years. I regret having done so, and I can go on indefinitely without cutting down, because I remove the useless wood each time the bushes are pruned. The test of the fitness of a branch to remain is that it shall have some decent new red wood on it. If it has not grown new wood about three-eighths of an inch in diameter since the last pruning, it has to be cut out or cut back. This work is done by a special gang of men who follow the ordinary pruners. The bush having been pruned is open to inspection. Each branch shows at a glance what it has done in the way of growth. If *all* the branches are bad, only one or two are removed and the rest given another chance, and they generally respond,

and soon begin to grow new wood if they are not heavily plucked too soon after pruning.

Letter No. 15 by "Custos Pamperio Horti" is very strong against hard pruning, and contrasts tea pruning with that of coffee, much to the disadvantage of the former. Did it strike him that the immediate effect of injurious pruning is to give a larger crop of tea leaf, whereas the opposite result would come about with coffee bushes. If the manager has pruned year by year "for leaf" *i.e.* lightly, the yield gradually gets less; the only remedy is to "cut down." But in coffee as soon as a branch or leading stem, (or whatever it was called) ceased to yield it was cut out, and *the rest* of the bush treated in a decent manner. Tea is not treated in this way because it will respond immediately to the knife, whereas to cut down a coffee garden means the loss of the crop for that year.

Letter No. 16 by "W. I. G." says:—"Tea is not nearly so severely pruned as it was a few years ago." Letter No 17 by "Incog" says:—"Tea occasionally requires heavy pruning but this is much overdone.' Letter No. 19 by "G. H. G." says:—"I have often been told by those who have had experience that flavour is greatly lost by cutting down old bushes to 12 to 15 inches after they have reached too great a height after successive prunings. I have never heard that such bushes ever regain their original flavour." Letter No. 27 by "S." says:—"Neither does severe pruning affect the quality, only shortens the life of the bush". I agree here because I believe that each cutting down reduces the vigour of the bush, and that this accounts for the many played out estates which have been abandoned. Letter No. 33 by "J. J." says:—"I am against severe pruning, medium is what I do, cutting down once in 6 years or so." The point of the matter is that discriminate pruning costs money year by year, and to save this expense, the bushes are cut down periodically. It cost little to cut down the bush. The relative cost would be as follows:—(1) cutting down every 6th year @ R2 per acre. 6 cuttings out of old wood @ R2 per acre=R12. Take a garden of 1,000 acres—cutting down cost R2,000, cutting out costs R12,000. Here is a palpable gain in solid coin. But what has the saving cost? First of all one or two invoices of thoroughly bad tea, say 1,000 maunds of tea @ R2 below average value. This means R10,000. Then a reduced outturn for a few years until the bush has re-grown to its full sizes which may be put down at anything up to R30,000. The deceptive part of cutting down is that a portion only of the estate is cut down each year and so no idea of the actual loss either in quality or yield can be formed. In some rare cases a manager advises, or is advised, to cut down the bulk of the estate and *then* follows one memorable year of bad quality and short yield, but still no lesson is learned from this. It is only hoped that the next cutting-down may be long deferred, or done regularly on a fixed proportion of the estate, so that the directors and shareholders shall not *notice* it. If you will not pay the estate extra R2 or R3 per acre per annum to have good pruning done, you will have to pay for it in steady loss, and eventually will lose the whole estate. Money saved on pruning is spent in digging the grave of the estate.

Letter No. 37 by "L." says—"(Severe pruning) is rarely resorted to: one case I know, when this was done, gave very beneficial results, both as regards yield, and at the same time quality was maintained." I hardly think that this refers to cutting down." "L." probably means a thorough cleaning out of the bush leaving all the thick branches. It is quite impossible that cutting the bushes down to stumps can give the same yield as if those bushes had been properly pruned and had not been reduced to such a state of overgrowth that they refused to yield. Cutting down a bush which has ceased to yield will cause it to yield *some* leaf. But judicious pruning will prevent the bush from *ever* getting into a non-yielding state. There *will* be a succession of new branches, if the old ones are removed as soon as they get too old to yield vigorously." Letter No. 45 by "M." says:—"Severe low pruning (necessitated by too close plucking and injudicious modes of pruning) have much to do with the falling off of quality." This is my own view. "Cutting down is necessitated by injudicious modes of pruning." I cannot agree that close plucking is the cause of it unless it has been done too soon after pruning. Give the bush time to grow enough leaf to carry on its proper work, and after that you can take all that appears if you have enough labour to do so. Letter No. 18 by "G." says:—"I believe that a high bush gives a better quality of tea than a bush pruned down low." The system I advocate will keep the bushes at one constant level. Letter No. 50 by "D." says—"Fields of hide bound bushes here and there are treated in this fashion. Severely pruned old coffee-land tea gets more frequent touches of this treatment as the growth generally is more mangy of this class of tea, and more subject to the growth of lichens and other pests." I do not agree with "D." that lichens are one of the pests. Moss on a tea branch means (I think) that the branch has ceased to grow, and to expand. If hard plucking deprived the branch of its leaf, there is not enough sap returned to make new growth of wood. The lichens find a surface (like a rock) which is undisturbed and promptly grow on it. Do you find moss on vigorous branches? If not it is *not* a disease but a sign that some other agency is killing that branch. It is a *sign* that the branch should be removed, because it has stopped expanding.

Letter No. 53 by "L." says—"Excessive cutting down (a pernicious system fortunately fast dying out) reduces the quality and the quantity for many months." "L." is convinced of the necessity of judicious pruning. The whole of this letter might be printed here with benefit. Letter No. 66 by "Old Dimbula":—"I have seen ten year old tea cut down to 9 inches or a foot. The reason given was to get good strong healthy growth." Well, it took three years to grow the size the trees were when pruned; the pluckings all that time have been a loss and the trees have not such good stems as they had previous to the heavy pruning. The trees should be pruned and not merely cut down, and this can't be done under R9 to R10 per acre. Here we have strong support to what I urge as the proper way to treat the bushes. I gave R2 extra per acre as the cost of the thinning out. "Old Dimbula give R9 to R10 as the cost of pruning and thinning out combined, so perhaps I should allow R40 per acre for cleaning out; but even this figure makes no practical difference in the loss from cutting down as compared with the gain of *money* saved by cutting down. I think that I have a good show of hands against "cutting down," but some say that it is necessary. I want to prove that it is *not* necessary. It can't be obviated by judicious pruning, which certainly costs more each year, and I think it *necessary* to have the cleaning out done separately. This entails more expenditure and more supervision, and I think that the *future* good of the bushes has been disregarded for these two reasons. Both Managers and Proprietors concur *because* there is less expenditure and less trouble, and because the enormous harm done by careless pruning is not apparent until the time comes when the bush *must* be cut down; and even then the harm is not noticed because the cost (*i.e.*, the loss) is spread over 5 to 10 years, by treating only portions of the gardens *each* year. If you really want to know the harm done, you must cut down the *whole* estate; the amount of loss having been ascertained, can be divided by 5 or 10, and you will then know whether judicious pruning is advisable, *i.e.*, is the *extra* cost of good pruning equal to the loss from cutting down divided by 5 or 10. The range of 5 to 10 is given for difference in climate, soil, jât of plant, &c. But even here the calculation must not stop. At the end of 5 or 10 years you must *again* cut down the whole estate. You will then find that the loss in yield is greater. And the third time of cutting down will prove

conclusively that it is a great mistake. "Only," your managers have said: "It *must* be done." I want to prove it need *not* be done. If any of the 84 planters who wrote in 1897 will take up this subject, they should not only say whether cutting down is or is not advisable, but they should state what method should be adopted to *prevent* the necessity. My system of pruning is as follows:—First year half the garden is pruned to pencil size, *i.e.*, all wood under three-eighths of an inch is cut out; new wood over that size is left about one to three inches in length; the rest of the garden is left unpruned. The second year this plot is left unpruned. The third year it is pruned lightly, merely cut across about three inches over last pruning. The fourth year it is left unpruned. The fifth year it is again pruned to pencil size. And so on, but at each pruning, when the bush is fully exposed, old wood is cut out, if found not to have made good growth during the two years from the last pruning." I have found this plan to answer for ten years, and as far as I can see it will answer for ever. After pruning I pluck for six months to a standard of two feet—nothing below that level is taken, so that the small bushes can have a chance of growing and the sides of the big bushes are allowed to extend. This growth below two-foot level supplies roots with all they require in the way of leaf to return sap for the wood. I fancy that a root cannot grow in size until it has got sap *returned from the leaves.* And if it cannot grow in size it cannot grow in length and go and fetch food from farther off or deeper down. Supposing the roots to have exhausted the soil, you will not get them to give fresh growth even if you cut the bushes down. If we come to examine the causes of the supposed necessity for cutting down, I think it will be found in the desire for getting the greatest immediate return without considering the future benefit of the estate. It takes a long time to seriously injure the tea bushes, and probably no one manager has ever watched the decadence of an estate, and ascribed it to the harm done by "cutting down." Nor as far as I know has any estate escaped from cutting down for a period of 20 years. If there *is* such an estate it could be used to back up my theory. If a discussion and expression of opinion can be re-started, it would be well to find out whether pre-sent-day planters acknowledge or deny that the tea bush *can* renew itself indefinitely from suckers thrown out direct from the roots. My theory is that suckers are not formed until the roots become too much for the upper growth. By judicious pruning and allowing sufficient leaf to the bush, it will grow roots in proportion to the growth above ground; when some of the branches get too old and hide-bound to allow the sap to pass freely, a sucker is formed to take up the surplus sap. The old branches should then be removed so that all the sap can go to nourish the suckers and supply good leaf from it.

But when a bush is cut down the roots do all they can to send out new shoots through the old channels. The roots are much too large for the new plant, and they cannot grow in size because there is not enough growth of leaf left by the pluckers to supply them *all* with sap. Some of them die out or become dormant, and come into use again when the bush has increased sufficiently in size and has enough leaf left on it to send down the sap.

Of course an excessive yield would sooner exhaust the soil, but no one would object to exhaust the soil by this channel, and he would have enough money to restore enough to the soil to maintain the yield of leaf. I think that the time has come to settle the question because the *permanence* of an estate has become one of prime importance. In former times when dividends were larger and easier to get the future was disregarded. It has probably become an accepted belief that every estate *must* deteriorate, but I deny it emphatically, and it will certainly add to the value of an estate if it can be proved that its yielding life *can* be indefinitely prolonged by judicious treatment, and that when the yield falls off from actual exhaustion of the soil it can be kept up by replacing the wanting constituents. There are many trees whose life under suitable conditions runs to thousands of years.

Tea is not old enough yet to state definitely that a bush *must* die within a stated period. It seems to have the power of reproducing itself indefinitely, and I think that this power should be used, and that the growth should not be forced by cutting down. This matter of cutting down tea is entirely one to be guided by the proprietors.

The planter may persuade the proprietor that cutting down is necessary, but he does not explain that this step will cause only immediate yield at the cost of the future efficieny of the estate. The proprietor, not knowing better, consents. He finds that the yield improves for a time, but again falls off. This recurs until the estate cannot respond; it is sold, and that is the end of it.

Machinery *must* wear out, and money is written off year by year for depreciation; equally tea bushes *must* wear out unless money is given year by year for more careful pruning, and they can be made to renew themselves year by year.

AGRICULTURAL EDUCATION IN GREATER BRITAIN.

PAPER READ BEFORE THE FOREIGN AND COLONIAL SECTION OF THE SOCIETY OF ARTS, ON TUESDAY, FEBRUARY 27, 1900.

By R. Hedger Wallace.

(*Continued from page 152.*)

As regards the rest of the African Continent, there only remains for me to mention that practical agriculture is taught in the Mission schools at the Gold Coast. Boys from the Government schools are also trained at a model farm. There is, further, on the West Coast, a scheme of agricultural instruction formulated, covering three years, by which, beginning with a year's work at a local Botanic Station, a selected pupil then proceeds for a year's work in Jamaica, and finishes his final year at Kew Gardens.

Coming nearer home, at Malta agriculture is not taught in the primary schools, but the Third Reading Book contains short lessons on Agriculture. Beyond this, agricultural education does not seem to receive any support. Cyprus also does not seem to have made any provision for affording instruction in agriculture. The aid may be given indirectly, however, for in 1896 Mr. Gennadius, who was formerly Agricultural Adviser to the Greek Government, was appointed Director of Agriculture in this colony.

In making this survey, I have now journeyed right round the world, following the common flag of Greater Britain. Our position in this country is, however, a peculiar one, in respect to agricultural education and many other things, for we are both a great Colonial Power and, at the same time, an assertive Free Trade nation. This, therefore, invalidates any useful comparison being made between ourselves and other nations, and such I do not intend to make. A witty writer has said that our population is brought up "upon grammar and ready-made goods." In Greater Britain these "ready-mades" of whatever nature are not so easily obtainable as here, for it must be borne in mind that in young countries the division of labour is not so complete as in the older ones, and, therefore, every man, in some slight degree, is a jack-of-all-trades. The two golden rules of colonial life being that a man should be prepared and willing to do anything; and, if you want a thing done, do it yourself.

I think it will be admitted that even the little information I have been able to present in this

paper regarding the work accomplished in Greater Britain, indicates that the value of agricultural education is universally recognised in the Empire. Its aim in the self-governing Colonies is to benifit the Imperial rate, and in the rest of Greater Britain to benefit the native race. The agriculturist in the self-governing Colonies, I would add, has, besides all the facilities for gaining knowledge that has already been enumerated the command of services of a large body of scientific men acting as chemists, botanists, vegetable pathologists, bacteriologists, entomologists, &c., in connection with departments of agriculture. Some of the Colonies in this respect are even better equipped than the Mother Country.

I have already stated that those who go abroad to Greater Britain with the intention of engageing in some from of soil cultivation, directly or indirectly, can be arbitrarily divided into two classes—planters and farmers.

As regards the first named, from the survey made it would seem, generally speaking, that agricultural education in Greater Britain is intended almost exclusively for the natives, the planter directs rather than for himself. The question thus arises that seeing that planters commonly cultivate tropical and subtropical plants under similar climatic conditions, is a suitable technical training and experience obtainable at home? Further, would the training of an English agricultural school be of any general service to a planter? These questions are undoubtedly-open to a good deal of discussion. The second group is the farming class and again practically the same questions can be formulated. Those who go abroad with the intention of farming find their way into one or other of our self-governing colonies, and they may be arbitrarily sub-divided into two divisions, *i.e.*, those who already have some experience of farm operations and practical farm work, and those who have not. Seeing, then, that in Greater Britain to-day there exists nine agricultural colleges and schools, and that they all make instruction in practical work a distinctive feature of their curriculum, the question is, would both the divisions of settlers just differentiated equally benefit if they studied at these institutions? Two reasons, I think, might be advanced why agricultural institutions, giving practically equal time to class-work and field work, are so universal in Greater Britain. The first is that those who have been settled on the land had themselves previously no experience of farm life, and would have welcomed such an opportunity had it been obtainable in their time, and now they judge of others needs by that of their own in the past. The second reason is that the majority of the pupils who do attend these institution are addmittedly drawn from towns.

Dropping now all arbitrary defferentiation the question here again arises, can a training or education for farm life in Greater Britain be obtained at home? Colonial authorities state emphatically that it cannot. To give one illustration in support of this statement, I may say that I find in "The Government Handbook of Victoria" it is stated, with respect to agricultural education, that "there are institutions in England which profess to give an agricultural education fitting young men for colonial life, but the training obtained under such circumstances must be very defective. The knowledge of colonial conditions must be wholly theoretical, and the time spent in such institutions is likely to be almost entirely lost." Here is an authoritative statement, but, of course, it must be borne in mind, and due allowance be made for the fact that the Governmet in question, like other Colonial Governments, have colleges of their own into which they naturally desire to attract intending settlers. Undoubtedly the practice of Canadian, Australian, and South African farming is not as ours, but then the principles are the same. It matters then little whether it be studied in this country or in some other part of the Empire. The institutions of this country are very naturally better fitted for training English farmers than colonial settlers, and the students attending them are not far removed from the influence of home. In the Colonies, on the other hand, and at the colleges there, the youth would be better trained for colonial life, but of course he would have to undergo an early separation from home and friends and all these two words imply. As to which is the best course to follow, authorities differ.

The agriculture of this country is the result of centuries of experience and progress, and has become definite and specialised, but in the colonies agriculture is passing through the experimental stage only. The secret of success in such a stage of agriculture lies in what should also be the watch word of the colonial farmer adaptability. The colonial settler is called upon to apply in a variety of ways, and to adapt to a hundred purposes whatever knowledge he possesses of observed facts, and common or general principles. Here again another question arises which could well be debated, *i.e.*—would an English training give a settler that hardiness, keenness, alertness, handiness, and general long-headedness necessary for action under the inclusive term of adaptability?

I have endeavoured to avoid, as far as possible, interpolating into this paper my personal opinion or views. My aim has been to show the amount of good work that has been planned, and also accomplished, in Greater Britain, in furtherance of the interests of agricultural education. If I have even partially succeeded in doing this, I venture to think two conclusions can be safely arrived at.

First, that throughout Greater Britain, irrespective of climatic, racial, and political divisions, there is a universal movement to give all interested in the culture of land every opportunity, facility, and assistance possible to improve themselves, their art and craft, and the land and its produce.

Secondly, that the purely educational or teaching facilities in agriculture offered by other portions of the Empire, where the general agricultural conditions are somewhat akin to our own, are not only so distributed as to cover fairly the area in question, but are also equal in educational value to any of the agricultural training or teaching institutions in this or the other countries of Europe.

These two conclusions I venture to think might be regarded as the logical sequence to the survey made, and facts recorded in this paper.

FRUIT CULTURE IN QUEENSLAND.

BY ALBERT H. BENSON.

THE COMPOSITION AND APPLICATION OF MANURES.

(Continued from page 154.)

FOR BANANAS.

All banana-growers know that this fruit thrives best in rich scrub land that is rich in humus and nitrogen; hence any manure that is applied should contain these elements. Farm manure is especially adopted for this crop on account of the large quantity of organic matter it contains, and when it can be obtained in quantity it is the best manurial agent that can be applied. If followed by commercial fertilisers, its beneficial effects are considerably increased. The banana is a strong quick-growing plant; hence it is necessary that the plant food supplied to it shall be such that it is in a readily available condition. This necessitates the use of quick-acting fertilisers, but they should be combined with a proportion of slower acting ones, so that the effects may be more lasting.

Where bananas are planted in old land it is advisable to apply the fertiliser at the time of planting, mixing it thoroughly with the soil that is placed

in the hole that is dug for the plant, so that the young plant will have a sufficiency of plant food from the start, and therefore make a rapid growth. Subsequent manurings should be applied broadcast round the plants or, in the case of old plantations, over the whole of the ground, so as not to confine the roots to one particular spot, and then chipped, harrowed, or cultivated in. The best time to apply such fertiliser is in early spring before the summer growth starts, as it will then be available for use when growth takes place.

Mix as follows:—

	cwt.
Superphosphate	6
Meatworks manure	6
Nipho	6
Sulphate of potash	2
	20

This will contain—5½ per cent. of nitrogen, 5 per cent. of potash, 9½ per cent. of phosphoric acid, of which 5 per cent. is water soluble, and be worth £5 16s. per ton.

The first application to the young plants when planting should be at the rate of 4 lb. per plant, and subsequent manurings should not be less than 10 cwt. per acre.

If wished, 2 cwt. of the nipho can be replaced by 2 cwt. of sulphate of ammonia. This will increase the percentage of nitrogen by, ·8 per cent. and the cost by 9s. per ton.

FOR PINES.

For pines no manure is equal to good farm manure, or well prepared compost. If the farm manure used contains a considerable proportion of sawdust, as is often the case when it is obtained from town livery or 'bus stables, it should be allowed to become thoroughly fermented before it is applied as this will tend to remove any deleterious properties of the sawdust. Where a commercial fertiliser is required, the plant food contained therein should be in a readily available form; and this has been especially noticeable at Redland Bay Experiment Orchard, where the application of superphosphate and sulphate of ammonia—particularly the latter—has produced very rapid and marked results. Where the land is impoverished it is advisable to apply, the manure previous to setting out the plants, which will then make a good start, but in rich land this is not necessary. The best way to apply the manure in this case is to take out a trench with the plough where the line of plants is to be planted; spread the manure in this trench and thoroughly mix it with the soil by running a Planet Jr. cultivator with only two narrow teeth up and down the trench, the plants being then set and the earth drawn round them. If commercial fertilisers are applied without being thoroughly mixed with the soil in this or similar manner, they are apt to burn the young plants should dry weather follow the planting. In any case, unless well mixed there will be more likelihood of loss, and the plants are not so well able to obtain it as it is in one spot instead of being evenly distributed.

In applying commercial fertilisers to older plants, especially when same are grown into a thick mass, I strongly advise their being composted as previously described instead of being applied direct this will supply both plant food and humus as well as cover for the surface roots, which is apt to be washed off by heavy rain.

The fertilisers should be made as follows:—

	cwt.
Superphosphate	9
Meatworks manure	5
Sulphate of ammonia	4
Sulphate of potash	2
	20

This will contain 5½ per cent. of nitrogen, 5 per cent of potash, 11 per cent. of phosphoric acid of which 7½ per cent. is water soluble, and is worth £6 12s. per ton.

Proportionate amounts of dried blood or nipho can be used in the place of the sulphate of ammonia the proportion of superphosphate being reduced accordingly. This will reduce the price of the manure-but at the same time reduce the proportion of soluble phosphoric acid. For pines in full bearing at least half a ton to the acre should be applied if no farm manure is used; less in proportion to the quantity of farm manure applied.

FOR STONE FRUITS.

Use a similar manure to that recommended for citrus, but reduce the nitrogen and increase the phosphoric acid and potash.

FOR STRAWBERRIES.

As the strawberry is a quick growing crop in this colony, and, as a rule, the plants only occupy the ground a few months, quick-acting fertilisers are essential. Well rotted farm manure dug into the ground sometime previous to planting is an excellent preparation for the crop, but when the soil is at all poor the following fertiliser should be placed in shallow furrows and well mixed with the soil as previously described in the case of pines, the plants set out and the soil drawn round them. The composition of the fertiliser is as follows:—

	cwt.
Superphosphate	10
Sulphate of ammonia . ..	5
Sulphate of potash	5
	20

This will contain 5 per cent. of nitrogen, 12½ per cent. of potash, 8½ per cent. of phosphoric acid, all water soluble; and is worth £8 2s. 6d. per ton.

From 4 to 6 cwt. to the acre, according to the richness of the soil, is a sufficient dressing. This manure will also suit Cape gooseberries and tomatoes.

FOR VEGETABLES OTHER THAN PULSES.

In order to produce good vegetables they must be grown quickly, thus the application of quick-acting manures is required. This will be obtained by the following mixture:—

	Cwt.
Superphosphate	14
Sulphate of ammonia	5
Potash	1
	20

This will contain 5 per cent. of nitrogen, 2½ per cent. of potash, 12 per cent. of phosphoric acid—all water soluble, and is worth £6 5s. 6d. per ton.

Apply from 4 to 6 cwt. to the acre. Instead of using all superphosphate, half bone phosphate and half superphosphate can be used. This will reduce the price 7s. 6d. per ton, and will render the manure more lasting.

In applying commercial fertilisers to vegetables, it is best to mix them thoroughly with the soil before planting, but, if wished, they can be used as a top dressing, taking care to distribute them evenly, and not to allow them to cover the leaves of the plants, as if so they will be very apt to scorch or burn them.

FOR OATS, BARLEY, CORN, OR SORGHUM, WHEN USED FOR FODDER.

A quick-acting manure is required, which should be applied at the same time that the seed is sown, and harrowed in the case of broadcast crops. If the corn or sorghum is sown in drills, the manure should be applied as recommended in the case of planting pines. It can be made as follows:—

		cwt.
Superphosphate	.. ..	10
Bone phosphate	.. ..	5
Sulphate of ammonia	.. ..	4
Sulphate of potash	.. ...	1
		—
		20

This will contain 4 per cent. of nitrogen, 2½ per cent. of potash, 15½ per cent. of phosphoric acid, of which 8½ per cent. is water soluble, and is worth £5 14s. 3d. per ton. Apply from 4 to 5 cwt. to the acre.

FOR BEANS, PEAS, COW PEAS, AND OTHER PULSES.

No nitrogen is required by these plants unless the soil is absolutely deficient in this plant food, and then it is advisable to give a little to start the plants till they are sufficiently strong to provide their own nitrogen. These plants require a considerable proportion of potash, so that in all soils that are deficient in this respect, a fertiliser rich in potash must be used. For an average soil the following will be found to answer:

		cwt.
Bone phosphate	... ..	10
Superphosphate	.. ..	6
Sulphate of potash	... ..	4
		—
		20

This will contain 8 per cent of potash, 18¾ per cent of phosphoric acid, of which 5 per cent. is water soluble, and is worth £5 12s. per ton.

From 5 to 6 cwt. to the acre, mixed thoroughly with the soil before planting, should be a fair dressing in soils of average quality.

The following table, which has been obtained from a number of European and American sources, gives the total amount of ash removed from the soil by 1,000 lb. of the following fruit—farm and garden crops, as well as the composition of the ash, showing tho relative proportions of phosphoric acid, potash, and nitrogen. In the case of the nitrogen, the amounts given represent not only that contained in the ash, but also that contained in the albuminous matter of the fruit or plant.

As previously stated, the mere fact that a given crop takes so much out of any given soil cannot be considered accurate under all conditions, but is at the best only an approximation. At the same time, it is of value, as indicating the particular plant foods which are required by different crops; and when this knowledge is combined with the experience gained by the practical application of manures and commercial fertilisers, it will be found to be of great assistance to all agriculturists.

—	Total Ash.	Nit-rogen.	Phos-phoric Acid.	Potash.
Fruits—	lb.	lb.	lb.	lb.
Apple ...	3·9	1·3	·1	1·9
Appricot ...	5·2	2·29	·71	2·2
*Banana ..	11·5	·8	—	—
Pine ..	3·5	·2	·15	1·7
Grape ...	5	1·6	·9	2·7
Orange ..	4·3	1·9	·5	2·1
Lemon ...	5·6	1·5	·6	2·7
Olive ...	14·2	1·8	1·2	8·5
*Peach ...	3·2	—	·5	2·4
Plum ...	5·4	1·8	·2	2·4
Cherry ...	5·8	1·8	·6	2
Strawberry ..	6	1·5	1·1	3
Farm Crops—				
Wheat, Grain	17·8	18·2	8·7	5·5
Wheat, Straw	38·1	5·9	1·2	5·1
Barley, Grain	24·8	15·1	7·9	4·8
Barley, Straw	45·9	6.4	1·9	10·7
Maize, Grain..	14·8	16	5·7	3·7
Oats, Grain ...	25·7	17·6	6·8	4·8
Oats, Hay ...	61·1	11·9	6·7	25·4
Lucerne Hay..	62	23	5·3	14·6

* Complete analysis not given.

—	Total Ash.	Nit-rogen.	Phos-phoric Acid.	Potash.
Beans, Grain..	31	40·8	12·1	12·9
Potatoes ..	9·9	2·1	·7	2·9
Sweet Potatoes	9·5	2·3	1	5
Mangolds ..	12·2	1·9	·9	3·8
Pumpkins ..	6·3	1·1	1·6	·9
Vegetables—				
Cabbage ..	14	3·8	1·1	4·3
Cauliflower ..	8	4	1·6	3·6
Carrot ...	10·2	1·6	·9	5·1
Celery ..	17·6	2·4	2·2	7·6
Onion ...	7·4	2·7	1·3	2·5
Peas ..	31·1	35·8	8·4	10·1
Tomatoes ..	4·7	1·6	·5	2·7

—*Queensland Agricultural Journal.*

GREEN TEA MADE BY "OLD CHA."

Sir,—I am now in a position to give you the result of the attempt (and so far the only attempt) made to manufacture green tea by my method, which though nothing to boast of, is, in my opinion, fairly satisfactory, considering the somewhat difficult and unfavourable conditions under which the trial was made.

I do not feel at liberty to mention names, but here is the report for what it is worth:—

	Colombo value.
No. 1.—Well-twisted O. P. leaf, uncoloured liquor, fine quality, pungent, but too light in colour ..	50 cts.
No. 2.—Pekoe leaf, liquor fine quality but rather too thin and pale in cup	35 „
No. 3.—Souchong leaf, pungent ..	30 „
No. 4.—Flat, flaky, fanning liquor, fine quality and pungent ..	27 „

These teas were made in a desiccator, a drier I had never used before, and I was rather afraid of the effects of the powerful fan. It was also my first attempt to make green tea for several years. The tea was not final-fired, nor was any care taken to make it look nice; but for these circumstances, the valuation might have been a trifle higher.

I see you head my letter in your issue of the 13th—"The Panning Process." This is a mistake. I do not use a pan, but use a sirocco or other modern drier instead. As I find these do the work quite as well, and as they get through the work much quicker, they are cheaper than the pan, which, though good enough in former days, is far too slow and expensive to suit present-day planters and present prices.

The proposal to glaze our teas, as desscribed by Mr. Street in a recent issue, is undoubtedly a good one, and should be adopted. It is really a different way of facing the teas, *and a much better way*, and would doubtless enhance its value in any market; but I think 210° far too high a temperature for final-firing Such a temperature would, I fear, reduce the strength and pungency of the liquor.

I have certainly seen black tea lose its strength and pungency by being final-fired at a very high temperature, but I forget now what that temperature was. By the old (Chinese) method, final-firing was a very slow process, occupying from 6 to 12 hours. The dhools were often left on for the night, the fires having been carefully covered with a thick layer of ashes—to prevent the temperature rising—and, seeing the tea could be left on 12 hours without being burnt, it is clear the temperature could never have been above 150—probably less, and I believe this to be the reason why China tea keeps better than ours. Anyhow, I should say 170 to 180 is the highest at which it would be safe to final-fire teas, whether black or green, and I believe this would be found to do the glazing quite as well as 210, though it might take a few minutes longer.—Yours, &c., OLD CHA.

—Local "Times."

THE RUBBER INDUSTRY OF THE AMAZON VALLEY.

A very important factor, from the merchant's point of view, in the rubber trade, is the loss of weight that is constantly taking place in raw rubber. This loss is extremely variable, and a consignee has to place the greatest faith in the consignor that the invoiced weight of rubber has really been shipped as more or less shortage invariably takes place. Moreover, the shrinkage in weight is so variable that no exact figures can be quoted by which it may be calculated. The cause being the evaporation of the water contained, it varies according to the quality, being greater in the case of the porous "Sernamby" than in the firmer "Fine" rubber. The longer rubber is kept and the larger the pieces the less it loses in weight. Dry "Sertao" rubber coming from distant parts, whence shipments are only made once a year, will lose only about 1 per cent. between the estates and Manaos; whereas newly-made rubber coming from close at hand will lose as much as 10 per cent. As the means of communication get more rapid, and the rubber reaches Manaos sooner after being manufactured, the tendency to lose in weight becomes larger. Between Manaos and foreign markets a loss of 4 per cent. may be taken as an approximation of the average loss of weight.

A machine, designed on the principal of a cream separator, to separate the caoutchouc from the watery part has been tried, but has not proved successful as regards the latex of the *hevea*, though good results have been stated to have been attained with the latex of the "castilloa."

Another means of separating the caoutchouc is to add chemical re-agents which cause the latex to coagulate. Of these acetic acid and corrosive sublimate have being found to give the best results. The latter owing to its antiseptic properties would appear particularly suitable. A solution of alum is used to a small extent in the State of Matto Grosso, to prepare rubber from the latex of the *hevea*.

The following analysis of the latex of the *Hevea Braziliensis* is given by Seeligman:—

	Analysis. Per cent.
Caoutchouc	32
Nitrogenous matter	2·3
Salts	9·7
Resinous matter	traces
Water	55 to 56

The rubber having been prepared, it is shipped from the estates in "balls" or "pellets" to merchants in Manaos, and by them sold to one or other of the export merchants in the same condition as received. By the export merchant it is cut up into small pieces, the "Fine" separated from the "Entrefine," and then packed in wooden cases, each case holding about 170 or 160 kilos. It is then shipped to Europe or the United States, as the case may be. Owing to the loss of weight already mentioned, each merchant is obliged to have his own store, as no warehouseman could give a receipt for a quantity of produce the weight of which is constantly varying. For the same reason rubber is rarely sold by auction.

The commercial system by means of which the working of rubber estates is effected is somewhat complicated. Goods are in the first place imported from abroad by one class of merchants named "Importadores." In Manaos and Para most of these are at present Portuguese houses. They usually buy on ninety days' credit. The goods are then sold on the Manaos market to another class of merchants named "Aviadores," who generally buy on a twelve months' credit. These "Aviadores" then ship the goods up-country to the estate owners. The "Aviador" business is chiefly in the hands of Brazilian and Portuguese firms. The estate owners then barter these goods to the men working their estates, who are not so much labourers as small tenants, the rubber trees being leased to them for the rubber which they extract, paying them any difference that may remain to their credit, over and above the value of the goods supplied to them, in cash. This rubber is then shipped by the estate owners to the "Aviadores" in payment of the goods that have been consigned to them. The "Aviadores," on receipt of the rubber, sell it without delay to avoid loss in weight, to one of the exporting firms, receiving payment at once, in cash. With this the "Aviadores" pay the "Importadores." The exporting houses cut, pack, and ship the rubber drawing against shipments, generally on London credits, at ninety days' sight, and selling their bills to bankers at Para. Shipping documents have generally to accompany the draft, and in case of shipments to the United States, a certified Consular invoice. Manaos being without telegraphic communication, and consequently without foreign banks, the exporting houses which buy rubber on this market are obliged to keep a supply of cash in hand to pay for rubber bought, which as has been already stated, has to be paid for at once in cash. Such is the so-called "Aviador" system, and so far it has been found to answer better than other methods of doing business. Suggestions have been made whereby it is proposed to eliminate some of these middlemen, and to bring the consumer into closer contact with the producer. In order to study this question it is necessary to consider the conditions under which the rubber estates are at present being explored and worked.

The *Hevea Braziliensis* is, as has already been stated, scattered through the Amazonian forests. In some places it is much more frequently met with than in others. Nothing but actual exploration and trial will enable the most experienced person to form any reliable opinion as to the value of a block of forest. The manner in which explorations are conducted is as follows:—An individual who enjoys a certain amount of credit in Manaos charters a small launch and freights her with a cargo of food, clothing, and implements necessary. He then proceeds to search in the low-class hotels and boarding-houses at Manaos and Para, or perhaps he may even go to the State of Ceara, whence the labouring classes are chiefly recruited, for a number of men with whom he intends to work his estate. These he engages, not on wages, but on the condition that he will barter his goods for the rubber they extract. Most of these labourers draw a considerable advance before they can be persuaded to go up-country. With this cargo and crew he proceeds to the district where he intends to work. Having arrived at a place which he considers promising, he despatches some of the most practised labourers, or "seringueiros," as they are here named, to explore the forest, find the rubber trees and open the paths between them. With the remainder he builds a store, known as the "Barracao," in which he stores his goods, and which becomes a rendezvous or nucleus for the colony. The men all this time are living at their own expense, the price of supplies given to them being debited to their account, to be paid for in rubber later on. The forest having been explored, the trees located and connected by paths, known as "Estradas," the men select which they are going to work. Each "Estrada" makes a loop, visiting generally some 100 or 150 trees, and returning to the starting point, generally on the bank of a river or stream navigable for canoes. Each man builds his own small hut, or "Baraca," where he lives and from which he works the two "Estradas" which he has selected. From time to time he pays visits to the central store to obtain goods, and deliver the rubber he has collected. This the owner of the store, or the "patron," as he is termed, buys from him at a price, generally fixed by the "patron" himself, and credits him with the amount as a set-off against the goods that have been supplied to him. As the "seringueiros" can, as a rule, neither read nor write, the opportunities of an unscrupulous "patron" are great. At the end of the season, that is to say, in January, most of these men return to Manaos. A fresh lot is generally taken up by the "patron" each year.

The labourer or "seringueiro" spends his day much as follows: Rising from his hammock just before day-break he takes a cup of black coffee. He then proceeds to tap the trees in one of the "Estradas," affixing at the same time the cups to catch the latex as it exudes. The necessary cups are placed at the foot of each tree at the time that the "Estrada" is being opened. By 9 a.m. he has tapped the trees and is back in his hut. He then proceeds to cook and eat a scanty meal. At about 11 a m. he again visits the trees, taking with him a vessel into which he pours the contents of the cups. By 1 p m. he is again in his hut. He then proceeds to smoke the latex he has collected during the day. The latex cannot be left standing over night, as fermentation sets in and "entrefine" rubber is the result. It is almost invariably, therefore, smoked each day as collected. By 2 p.m. or 2-30 p.m. he has generally finished his day's work, and can spend the rest of his time in idling, hunting, or fishing as he pleases. On the following day he rests the "Estrada" which he worked the day before, and works the other. An active man sometimes works four "Estradas" two each day. Such men are known to produce as much as one ton of rubber in the season. It is on such performances as these that calculations quoted in prospectuses of rubber companies distributed in the United Kingdom seem to be based. They are, however, quite erroneous when applied generally. In a good place an average man will make as much as 4 kilos. of rubber in a day, but it must be remembered that he does not work all the year round, and that he loses many days when it is raining or when he thinks it is going to rain. Any excuse is good enough to prevent a "seringueiro" from going into his "Estrada."

The season during which the "Estradas" are worked lasts from August till the beginning of January. During the remaining months of the year there is generally too much water in the forest to allow the "seringueiros" to enter the "Estradas."

When considering the question as to whether British companies have here a good opportunity for the investment of capital, the following points should be borne in mind. Rubber is brought down to Manaos at the present day from beyond Iquitos, in Peru, and from beyond Orton, on the River Beni, in Bolivia, and goods are shipped to there from Manaos. A glance at the map will show how remote are these places. It is reasonable to suppose that natives of the country, who well understand the matter, would not go and explore so far afield if workable forests existed nearer home. The fact of their doing so points to the probability that most of the forest worth obtaining in the neighbourhood of Manaos has already been taken up. Of course, this does not mean that a company could not purchase already opened up estates, in good condition, and do good business with them. But again certain difficulties to be encountered should be remembered. The greates of these is the quantity and quality of the available labour supply. A company would have to work on a large scale and have a well-ordered system. The labourers to be found in Manaos are an extremely independent, not to say unruly class, and although the comparative rarity of crime up-country speaks well for their conduct on the whole, yet they are so unused to obey any sort of discipline that it would be very hard to work with an organised estate, especially as these is practically no legal authority outside the towns, and every man's will is, up-country, a law unto himself.

For the individual enterprise of that class of men which has done so much in opening up other tropical countries, men of resource and adaptability who prefer a rough life, there is probably a good field in Amazonas. Beginning, as they naturally would, on a small scale, and extending their business, they could probably do well. When the way has been opened by these, and a class thus created who really understand the business, there will be more opportunities for companies to work with success. It must be remembered that at the present time rubber export merchants have many difficulties to contend with. There is considerable competition in their business, and there are the unending and baffling variations in exchange. A company that owned rubber forests on a large scale could avoid exchange transactions almost entirely. The necessary goods imported would be paid for in London by the results of the sales of the rubber produced. Moreover, once a rubber estate is in good working order, it should be possible to make very certain calculations as to its annual yield. Taking these points into consideration, it would appear that the natural extension of the rubber merchant's business will be in the direction of securing the actual forests and lands in order to control the supply. No doubt means will be found eventually to overcome the difficulties stated above.

Owing to the recuperative power of the tree it is improbable that the available supply of rubber from the Amazon valley will be exhausted in the near future. Also the enormous area over which the estates extend makes it unlikely that unexpected events should occur by which the industry as a whole would be damaged, although, no doubt, local checks may be expected from time to time to occur For the same reason, and owing to the scarcity of labour, it is improbable that any very sudden increase or decrease of the annual production will occur. The tendency is at present for a slight increase of the total production each year.

The best district in Amazonas is commonly reputed to be that of the River Acre and the headwaters of the Purus.

Two British companies are at present established in the Amazon valley—namely, the Para Rubber Estates, Ltd., and Amazonas Rubber Estates, Ltd. The former have an already opened estate in the islands near Para, whilst the latter are breaking in virgin forest on the headwaters of the River Teffe. in the State of Amazonas.

Beside these, a Belgian company named "La Bresilienne" is working an estate near Para, whilst a French company, the "Camptoir Colonial Français," is working some estates on the River Javary. Several other French, German, and Belgian companies are said to be about to be organised for the same purpose.

Caucho is a vegetable product similar to rubber in many of its qualities, but inferior to it in usefulness. It is obtained by tapping trees much in the same way as rubber. The tree from which it is obtained is a variety of the "Castilloa." This tree prefers drier parts of the forest than the *hevea.*

Owing to the fact that the laticiferous system is not connected throughout the tree, it is not possible to drain all the latex by tapping only a small area of the bark, as is the case with the *hevea.* The tree has, therefore, to be cut down in order that the whole tree, including the branches and twigs, may be tapped. The roots also, which often project above the ground, are tapped. I am told that it takes as much as 15 days for the whole of the latex to exude from the tree. The latex is collected first in small cups placed to receive it, and subsequently is poured into a suitable vessel, or sometimes into a trough cut in the tree itself or into a hole made in the ground. A small quantity of soap solution is added to it to produce a more rapid coagulation. The juice of a creeper named "vitelha" is generally added for the same purpose. When the latex has coagulated, which takes some days, the mass is taken out, and caucho "slabs" are thus formed. Caucho "balls" are made by rolling up strips of the coagulated latex that has exuded from cracks in the bark. By common accounts an average caucho tree will yield from 30 lb. to 40 lb. of caucho, including the scraps.

Owing to the fact that the trees are cut down and destroyed, the collectors, or "caucheros," as they are called, are constantly moving about to discover fresh trees. Whereas at one time nearly all the caucho came from Peru, it is now more extensively worked on the Javary. During 1899 a large amount was

also received from the Purus. The actual work of exploring and tapping caucho trees is still done chiefly by Peruvians, even in Brazil, the Brazilians preferring to work the *hevea.—India-Rubber and Gutta-Percha Trades' Journal.*

Of late years the enormous consumption of rubber in the manufacture of bicycle tyres has created a very great demand. The supply not being able to cope with this demand the price has steadily increased, and considerable attention is now being paid to the production of rubber all over the world. So great is the demand at present that although the supply from the Amazon Valley alone has increased from 8,635 tons in 1880, to 25,370 tons in 1899, the approximate price of 2s. 6d. per pound in 1889 increased to 4s. 6d. per pound in 1899. The British Vice-Consul at Manaos states that the total world's supply to-day is about 120,000,000 to 130,000,000 lbs. valued at about £15,000,000. At tho present time laticiferous plants yielding "caoutchouc" or "rubber" are being worked for commercial purposes in Brazil, Bolivia, Central America, East and West Africa, whence come the chief supplies, while Guiana, the Eastern Archipelago, Madagascar, India, and Ceylon contribute a small quantity to the general stock. More than half the total supply is exported from the Amazon district. In Brazil several kinds of laticiferous trees exist from which rubber is manufactured. In the State of Ceara, the *Manihot Glaziovii*, locally known as the Manicoba, is fairly extensively worked, and considerable attention is being paid to its cultivation. In the State of Maranho the *Hancornia speciosa* or Mangabeira is beginning to give results. These trees, however, are unimportant compared to the *Hevea Braziliensis* or Seringueira, to which the Amazon Valley owes its present prosperity. The *Hevea Braziliensis* is found scattered through the forests that clothe the banks of the Amazon River and its tributaries. It does not strike the eye among the innumerable varieties of trees to be met with in the Amazonian forests, and is often difficult to detect. A peculiar glistening of the trifoliate leaves and the whiteness of the bark serves as a guide to the practised eye. The tree grows to the height of 70 to 100 feet, and as a rule, when full grown, a girth of from 5 to 7 feet at a height of one yard from the ground. The tree flowers in January ; the seeds are ripe and begin to fall in March in the case of old trees, and in May in the case of young trees The seeds are contained in a hard shell, three or four in each shell, which hang by a short stalk from the upper and outer branches. When ripe the shell explodes, often with a loud report, scattering the seeds to a considerable distance. For this reason it is difficult to procure seeds. There are for practical purposes three distinct varieties of the "seringueira" to be met with in the forest. These are locally known as the seringueiras "casca vermelha" (red bark), "barriguda" (bellied), and "casca preta" (black bark). The first of these, the "casca vermelha," grows in the higher parts of the forest which are seldom or never flooded. The latex which it yields is scanty, thick, and will not run. It is therefore of little value. The second of these the "barriguda," so named because the trunk increases very rapidly in thickness towards the base, grows in those parts which are almost constantly flooded, named "igapos." It yields plentifully a thin, watery latex, which is of little value. The third variety, the "casca preta," grows in those parts where a certain amonnt of drainage exists, and which form a intermediary zone between the permanently flooded parts and the high land. It is this variety which yields the latex from which the rubber of commerce is manufactured. The "latex," or as it is commonly known, the "milk" of the tree, is a milky juice contained in special tubes running amongst the other tissues of the plant. These tubes, in the case of the hevea, are connected, forming what is known as the "laticiferous system." The latex is quite different from what is called the "sap," and probably does not play any part in the nutrition of the tree. According to some authorities it forms a reserve of water to be drawn upon in cases of drought. The actual extraction of latex cannot kill the tree, and the common statement that the trees are "bled" to death is a mistake. As a matter of fact, though trees, exhausted, inasmuch as they will not yield any more latex are common—actually dead trees, killed by overtapping are rarely met with. The latex as it exudes from the bark is of a dazzling whiteness, resembling milk, which it also resembles in composition, inasmuch as it consists of an emulsion in which "caoutchouc" takes the place of the better in the ordinary milk. The fluid part of the latex consists of water with very small quantities of albuminous matter, organic acids and phosphates in solution. The extraction of the latex, or as it is usually called the "tapping" of the tree is effected by making an incision in the bark of the tree. From this incision the latex flows for about three or four hours, after that it stops flowing of its own accord. The incision should not penetrate beyond the bark, which is generally about ⅜-inch thick, into the wood of the tree, and for this reason a very small axe, which rapidly thickens wedge like from the cutting edge, is used, the shape of the instrument preventing its entering too deep. The axe is generally about ¾-inch wide. The custom is to strike with it a backhanded blow upwards, thus making an oblique cut in the bark. It is probable that a better method would be to use a chisel and mallet and make a V shaped incision. Recent experiments at Henaratgoda have shown the advantage of this shaped incision. The incision having been made, a small tin cup, of a capacity of about four ounces, is affixed just below it to receive the latex as it flows. This is effected by pressing the edge of the cup, which is sharp, into the bark, until it gets a sufficient hold to remain firm. By this method, however, a second wound is made in the bark, which is injurious. No better method has yet been suggested. In some places a winding groove is cut in the bark of the tree, and by means of a clay breastwork the milk is conducted into a vessel placed at the foot to receive it. This method is found, however, to be very exhausting to the tree, and is falling into disuse. The usual mode of tapping is to make an incision with the axe at the height of some six or seven feet from the ground; on a level with that incision and at a distance of some eight inches a second cut is made, and so on round the tree. On the next day incisions are made just below these, and so on day by day, until they reach the ground. Incisions are then made on the same plan, beginning as before from the top and working downwards between the former rows. A tree that will carry seven cups eight inches apart is considered a large one and although trees that will carry eight or nine cups are to be met with. the average do not carry more than four or five. The latex having been obtained and collected, the caoutchouc, or rubber known to commerce, may be obtained from it in various ways. The only method, however, that has met with practical success is that of evaporation, by which the watery portion of the latex is driven off, and solid caoutchouc remains. The object to be secured is that as little water as possible shall remain in the caoutchouc, the putrefaction of the caoutchouc owing to the presence of these matters being extremely detrimental to its elastic properties, and therefore to its market value. In the Amazon district the method followed is to light a fire upon the ground, and to invert over it a specially-constructed, funnel-shaped chimney. From the narrow end of this funnel, which is open, the smoke and heated gases pour out in concentrated form. The fuel used for the fire consists, as a rule, of chips from any hardwood tree that grows handy to the labourer's hut, The nuts of the "Urucury palm" (*Attalea excelsa*) are sometimes used, their smoke containing a trace of acetic acid, and creosote being

found particularly effective in curing the rubber and preventing putrefaction. It is, however, a mistake to suppose that all over or even a large proportion of the rubber coming from the Amazon district is cured in this way. It is, on the contrary, very rarely that the rubber cutter will be at the trouble to collect these nuts, he nearly always prefers to use wood chips, which give him less trouble to procure. The fire having been made, and a large stream of hot smoke pouring out of the chimney, the operator seats himself on a small stool by the side of it. The latex is contained in a basin placed at hand. In his right hand he holds a paddle-shaped piece of wood, in his left hand a small calabash. Dipping the calabash into the basin of latex he pours a small quantity over the paddle, which he then revolves in the smoke issuing from the chimney. That having dried in a layer over the paddle, he repeats the operation. In the course of time a "ball" or "biscuit" of solid rubber is thus formed. In some parts where it is the custom to manufacture very large balls or pellets, an arrangement is made by means of a pivot to rotate the ball over the chimney. The wooden core is withdrawn through a slit made in the "biscuit," or simply drawn out in the case of the pellet. The latex of a tree named "macaranduba" (*Mimusops elata*), and more often that of a tree named locally "amapa" is sometimes used to adulterate that of the *hevea*. In both cases the adulteration is extremely prejudicial to the quality of the rubber produced. Three distinct qualites of rubber are manufactured in the Amazon district, namely, "fine," "entrefine" and "sernamby" respectively. "Fine" rubber has been well smoked, and is free from putrefaction. "Entrefine" rubber has been either burnt while been smoked, or has been insufficiently smoked, and has therefore putrefied. It is due to carelessness on the part of workmen, which it should be possible to avoid. "Sernamby" is the "negro-head" of commerce, and consists of scraps mixed with dirt, or strips peeled off the bark of the tree, and mixed with impurities of all sorts.—*Journal of the Society of Arts.*

DISTANCE IN PLANTING.

We are often asked, at what distance should Nutmegs, Rubber trees, Cacao trees, Mango trees, &c. &c., be planted. Now it is absolutely impossible to lay down any hard and fast rule as to what distance trees should be planted apart, for the matter hinges on many contingencies, which if unknown will lead to erroneous conclusions. If Rubber trees are to be planted, let us first ask what is required, or what is to be aimed at or produced. It is evident that we do not want a low straggling tree, but one having a straight trunk free from branches. The best koown method of producing such trees is to plant thickly. It is very false economy to plant thinly with the view of saving cost of plants and planting, for unless trees are thickly planted there is no hope of getting them to make straight stems without a lot of pruning; and even with this well done, they will not be as good or as shapely as they will by nature's pruning. This is a well known fact among foresters and the amateur cannot err in planting too close—as it is always in his power to cut out, if his plants are at any time crowding each other, but on the converse, he cannot put in a plant to supply vacancies without it suffering from the overgrowth of those already established. It is easier to cut out therefore than to supply, and a better and more scientific practice. A recent writer in the Queensland Agricultural Journal, one of the leading periodicals of the day in its special subjects says:—

"That the trees are allowed to grow thickly together, that they may be drawn up to a suitable height before the forests are thinned, and then, by the time the rotation period has arrived they expand laterally, and form fine thick boles." They have in fact made "height growth." The term "height growth" in forestry is derived from the German, but the principle has long been known and adopted by all who are sufficiently acquainted with the leading principles of Forestry. An example may be made with low growing plants to illustrate the subject. If plants are planted closely, it will be found that they grow much taller than when planted singly on the open, because they are nature pruned, that is to say nature does not allow side branches to develop and straight clean stems result. In a Rubber plantation it is of the first necessity to have as large number of clean straight stems on as small an area as possible, and this result can be attained by close planting.

Planting must however be regulated by the quality of the soil on which the plantation is to be made, for it is clear that, what would be close planting for a rich soil would be wide planting for a poor one, and therefore the richer the soil the wider apart may the trees be successfully planted. The nutmeg does not require to have a straight stem, but rather a spreading top, which should be well exposed to light and air. Nevertheless to plant the nutmeg at too great a distance, is a mistake; for unless the ground is well covered over with foliage, too much evaporation goes on in dry seasons, and the trees suffer. It is better therefore to manage to plant your trees to cover in the ground by their branches meeting above as soon as possible within reason, allowing each tree a spread according to the richness of the soil.

With Cacao I am decidedly of opinion that closer planting, than is generally practised, would be beneficial. If a Cacao Estate is examined it will be found that the best bearing portions are those which best cover the ground, and the worst portions, are those where the trees are too thinly planted to do so.

In some cases this cannot be avoided, as the planter cannot fully prove the nature of his soil, until he plants his trees, and it is generally more convenient to plant all the trees at the same distance. Where, however, the soil is known to be poor, it will be distinctly to his advantage to plant more thickly and get the ground covered at once. Too thick planting on the other hand is as great a mistake as the converse, and on rich soils examples are easily found where the trees have not sufficient room to expand their branches in accordance with the amount of nutriment available.

This is however much more easily remedied than too thin planting, for the judicious pruner will first of all give room by cutting away gradually, for a season or two, the branches from those trees which he marks for removal, and then, in the end will remove them to make room for more vigorous brethren.

With the Mango, the same arguments may be applied. With it we require branches and the stem is of little consequence but it is highly important that the branches should have all the light and air possible to induce flowering and fruiting, and therefore the mango may be planted in isolated positions with great advantage.

It is very important in making plantations of any kind to get the trees to all "come away together" —(*i.e.*) to get them well started and not to allow blanks to occur, and the cultivator will do well to maintain regular supplies especially during the first two years.

In making plantations of Rubber where the trees are planted close together, with the view of securing straight, clean stems, it should always be the aim to surround the plantation with a belt of trees of bushy habit, to act as a wind break; for it is clear, that where a forest of clean stems exist open to the wind, evaporation would be almost as great as in the open, and that high winds would be liable to do considerable damage, which might be avoided by this simple means. It is well to remember therefore that it is better in most cases where timber or stem is required, to plant thickly; while where fruit is required from the smaller branches, these may profitably be planted in more exposed situations.—*Trinidad Bulletin.*

BASIC SLAG TO INSURE BEST, QUICK, AND PROFITABLE RETURNS.

(Extract from an Essay by Professor Dr. P. Wagner, P.C. Director of the Government Research Station, Darmstadt.)

I have said already that to a soil distinctly poor in Phosphoric acid more of this ingredient should be restored than is being removed by the crop. This application of a Phosphoric acid manure should be continued until the Phosphoric acid has become laid up as a store, for use in the soil ensuring quick and profitable returns. Only then will it suffice to return to the soil the same amount of Phosphoric acid by means of cattle manure or artificial Phosphoric acid fertilizers as is removed by the crop.

As the most suitable Phosphate to increase the fertility of the soil, I have recommended BASIC SLAG, and I would draw attention to a previous contribution of mine in which I proved the superiority of Basic slag over Superphosphate. I would point out that quick and satisfactory effects can only be looked for from the application of Basic slag rich in Phosphoric acid readily available to the plant, *i.e.*, Phosphoric acid soluble in Citric acid. Below I give results obtained by the application of Basic slag with a low percentage of Phosphoric acid soluble in Citric acid and Slag, most of the Phosphoric acid of which was soluble in Citric acid. It will be perceived that the efficacy of the Basic slag increases in proportion to the solubility in Citric acid of the Phosphoric acid in the Slag. The trials were made in three rows side by side:—

Phosphoric acid.		Amount of yield	Increase in yield over unmanured plot.
0·5 gr.	Superphosphate	541·2 gr.	397·2 gr.
0 5 ,,	Basic slag No. 1. 89% soluble in Citric acid.	503·1 ,,	359·1 ,,
0·5 ,,	Basic slag No. 2. 82% soluble.	464·7 ,,	320·7 ,,
0·5 ,,	Basic slag No. 3. 65% soluble.	416·7 ,,	272·7 ,,
0·5 ,,	Basic slag No. 4. 39% soluble.	306·9 ,,	162·9 ,,
0·5 ,,	Basic slag No. 5. 36% soluble.	281·1 ,,	137·1 ,,
1·0 ,,	Phosphate meal prep. 2% soluble	159·0 ,,	15·0 ,,
No manure		144·0 ,,	0·0 ,,

The prepared Phosphate meal hardly had an effect upon the yield worth mentioning. Basic slag No. 1, 89% of the Phosphoric acid of which were soluble in Citric, acid very nearly equalled in effect the increase in yield derived from the application of Superphosphate. But Basic slag No. 5, of which only 36% of the Phosphoric acid was soluble in Citric acid, had only one-third of the effect of Superphosphate. As the quality of Basic slag offered by the trade varies to a great extent, it is not to be wondered at that the results obtained by the application of Basic slag have often differed. *It is most satisfactory that the difference in quality and the value of the various Slags as to their manurial effects is now becoming more and more widely known.* It is also a matter of satisfaction that almost all Thomas's Phosphate Works now use Quartzose for dissolving the hot fluid of the Slag, *and that farmers are now beginning to lay stress upon a fair percentage of the Phosphoric acid in Basic slag being guaranteed as soluble in Citric acid.*

PLANTING IN TOBAGO.

(*Continued from page* 155.)

9. Mulch around the trees, but do not disturb the roots by forking. Scratch the surface gently with a hoe or rake previous to laying on the mulching.

To "*mulch,*" is to place upon the ground, near to the trees, vegetable matter which will gradually afford food to the roots and check the evaporation of water from the ground. Dried or wet grass, leaves &c. usually called "*trash,*" should be laid six to nine inches deep about each tree, leaving a space of six inches clear just around the stem. A few heavy stones may be placed on the mulching, if necessary, to keep it in place, but this is seldom required except in windy districts, and there, cacao should not be planted. The trash or mulch will keep the ground perfectly moist through the dry weather, and enable the cacao plant to pass successfully through the dry season. Mulching should therefore be done previous to the dry weather setting in, but if any quantity is left undecomposed when moist weather again prevails, it should be raked into wind rows and allowed to rot, and then evenly spread over the whole surface.

10. Always keep the ground clean and free from weeds. The ground should be kept clean and free from weeds, or they they will overgrow the young cacao plants and rob them of their nutriment. Frequent hoeings should be made, but the greatest care should be exercised not to cut too deep with the hoe, or the roots may be injured. It is best to weed by hand immediately around the stem of the trees.

PRUNING.—Let the cacao tree grow freely during its young state, and allow the young branches to spread until neighbouring trees meet; but keep them in form and well balanced, by pinching out the points of the shoots, from time to time, as found desirable. Allow the tree to form its head, but remove all weak branches with a sharp knife, and never allow any part of the tree to get too thick, or the free circulation of the air will be prevented. All branches which are decayed or diseased in any way should be at once removed. No attempt should be made to limit the trees to a certain height. The larger the tree, the more fruit it can bear. Shoots called "*robbers*" or "*thieves*" when occurring out of place, should be removed; but when they arise where a branch is required, they may be used with the greatest safety and economy, as for example to rejuvenate stunted trees, and to replace diseased or broken branches, which have had to be removed.

In pruning, use a sharp knife. No special directions can be laid down how to use it. A good pruner is "made not born," and the best written instructions are but a poor substitute for practical teaching. The general principles which should guide everyone who is cultivating cacao are:—Prune little and prune often. Never cut large branches away at one time. Cut close and clean, so that no water may lodge in the wounds. Never leave stumps or spurs to rot out. Cover all large wounds with tar or paint.

PICKING CACAO.

The first point to settle is, when the pod is ripe. It should be ripe but not over-ripe. The colour should be fully attained, whether red or yellow. If the beans shake easily about, the pod is probably over-ripe. When picking Cacao always cut the pod with a sharp knife.

Never pull or tear the pod off by hand. If you do, you injure the tree, and it will not bear from the same place next year. It is better not to break or open the pods amongst the Cacao trees, nor allow open shells to lie about. The shells should be buried as soon as possible. They will thus enrich the land and probably prevent disease from spreading in the locality.

CURING CACAO.

The following brief account is taken from "Notes on Curing Cacao for Small Settlers" prepared by Mr. W. Cradwick, and published in the Jamaica Bulletin 1896, p. 15:—

The best vessel in which a small cultivator can ferment Cacao is an ordinary flour barrel. To prepare this for the reception of cacao beans, first bore about a dozen holes, each half an inch in diameter, in the bottom of the barrel, then place about ten inches of banana trash in the bottom of the barrel. Line the sides also thickly with trash, and have a sufficient quantity on hand to cover the beans when placed in the barrel. When the barrel is ready break the whole of the pods and place the beans in the barrel, covering with the banana trash. The beans must be left to ferment for two days, then remove one-third of the beans and lay them in a heap on the floor and mix them thoroughly. Remove the balance of the beans and mix them also, but do not put the two heaps together. After placing fresh trash in the barrel, put the beans which were at the top back into the bottom of the barrel and those which were at the bottom, place at the top. Cover with trash in the same way as before and leave for two more days, when the beans should be treated in exactly the same way as before. They should then be left for two more days, when they are to be taken out and washed thoroughly. On the day the beans are finally removed from the barrel the work should be commenced very early in the morning, so as to get all the sun possible on the first day, for the beans mildew very quickly. They should be washed immediately they are taken out of the barrel as this helps to keep them plump.

The proper amount of Cacao to ferment in one barrel is the quantity of beans obtained from 1,000 ordinary sized pods. If many more than this number are put into one barrel, the fermentation is too great and the beans turn black.

If a less quantity, say below 700 pods, are to be fermented, the green trash and more of it must be used, and a weight not exceeding 28 lb. placed on the top, which helps the fermentation.

When the Cacao is being dried, it is not advisable to expose it after the first two days to the extreme heat of the mid-day sun; it is better to take it in about 9 o'clock, and then put it out again between three and four o'clock.

Disease.—If any pods are observed which have commenced to become black or rotten, either at the top or the bottom, they should at once be carefully collected and destroyed. It has been found that this rotting is caused by a highly infectious disease, and that it is liable to spread if rotten shells are left on the field, or rotten pods allowed to remain on the trees.

II. SHORT NOTES ON OTHER PLANTS.

Orange.—The cultivation of the orange is very simple, for when once the plants are fairly in growth, all that is necessary is to keep them free from weeds and well watered. The orange delights in alluvial soil, but, if well watered and manured, will thrive almost anywhere. The plants should be placed about 25 feet apart in well-prepared sites. The future positions of the plants having been marked off at the required distances, holes should be dug out about 18 inches deep and 2 feet wide. . The soil, which has been taken out of the holes, when freed from roots and stones, should be returned to them, but, if of a poor nature, should be enriched with good rotten manure. When the soil thus treated has settled down, one plant should be placed in the centre of each site and well watered. They will bear fruit in about 6 years. Whenever possible "grafted" or "budded" trees should be planted in preference to trees raised from seeds. Grafted or budded trees bear in 3 or 4 years, and they can be depended upon to produce first-class fruit.

Shaddocks and Grape Fruit.—These require the same treatment as oranges.

Mango.—The mango thrives best in rich, deep, well-drained soil, and should be given a rather dry, open situation. The plants should be carefully set, at not less than 30 feet apart, in holes prepared in the same way as recommended for the orange. The only pruning they require is the cutting out of weak and straggling growth. The size and flavour of the fruit are much improved by high cultivation. The best kinds only should be planted. Seedlings cannot be relied upon to come true from the parent, and, accordingly, it is better to pay more for a known grafted variety, such as "*Julie*," "*Peters*" or "*Divine*," than to grow a tree from seed, only to find after years of waiting that it produces fruit of a worthless character. Mangoes generally bear fruit in about 5 or 6 years. These remarks concerning seedlings apply to other fruits as well as to the mango.

Star Apple.—This tree thrives under the same conditions as the mango, and should be given the same amount of room.

Bread Fruit.—As this tree attains to a large size, the plants should be placed 40 or 50 feet apart, in rich, well-drained soil, care being taken not to injure the roots or leaves. The sites should be prepared in the same way as recommended for the other fruits. They will probably bear in 4 or 5 years.

Pine Apple.—The pine apple succeeds best if cultivated in a well-drained, rich, fibrous, loamy soil, of such a nature that it will not become compact by frequent waterings. The more light and air the pine-apple gets, the better it will thrive, and, therefore, it is advisable that the plants should be set 3 feet apart every way. The ground, after being well dug all over, should be thrown up into low ridges, three feet apart, and the suckers (3 or 4 of the bottom leaves having been previously taken off each, so as to enable them to throw out roots more freely,) should be planted very firmly on the ridges, also 3 feet apart. The suckers on the second ridge should not be planted opposite those on the first, but alternate with them, thus giving each plant much more room. When the plants are in active growth, they should be mulched with manure, stable manure being preferable, as it affords ammonia, which is favourable to their growth. If really fine results are desired, the plants should, after they begin to show their fruit, but before it begins to ripen, be watered with moderately weak, liquid manure, made from horse, sheep or pig dung; as soon, however, as ripening commences they should be kept dry. Under the above treatment, they should fruit in about 12 months.

White Yam.—White yams thrive best in a rich, loamy soil, in a warm, sunny situation, protected from high winds. They should be planted six feet apart, on hills prepared in the following manner:— The ground after being freed from weeds, should be deeply dug, and then about 3 or 4 bushes of soil should be scraped up in a heap, where a plant is required. A piece of yam, or preferably a yam head, weighing from one to two pounds, should be placed in the centre of each hill and covered by about two inches of soil. When they have made from 12 to 18 inches growth, stakes, 10 or 12 feet long, should be struck in for them to twine around, (one in the centre of each hill.) Beyond being kept free from weeds they will require no further care until ready for digging, which is usually in from 9 to 12 months' time.—*Imperial Department of Agriculture for the West Indies.*

SWEET CASSAVA.

(*Manihot utilissisma*)

The following results have been recently been obtained by Professor Carmody as the result of an Examination of Sweet Cassava (Jamaica variety) grown at the Experiment Station St. Clair.

SAMPLE SWEET CASSAVA, GROWN AT ST. CLAIR.

Prussic Acid .. .. 0·17

This is fully in accord with the result obtained by Francis, published in Analyst for 1877, in which, the mean of fifteen samples was found to be H. C. N, ·0168 or 1·175 grains per lb. Dr. Taylor fixes the poisonous dose of Prussic acid at one grain, but at the same time reports the death of a healthy woman who died in twenty minutes from a dose equivalent to 9-10 of a grain of Anhydrous prussic acid. It appears therefore that the root is distinctly poisonous in its raw state, and that it is rendered harmless by cooking, for some of the roots were eaten by myself and four members of my family on the day it was dug up, without inconvenience. It would be convenient to know how much of the poison is in the skin of the root and how much among the starchy fibres; how much is dispersed by boiling or roasting, and how much is left in the substance when reduced to an eatable state. In countries where *Cassava* is the staple article of food; cases of poisoning by it are seldom heard of, but the poison found in the root by the Professor and the cases of reputed poisoning which have occurred, appear to show that a full examination of our product is necessary for the safety of consumers and we believe that work on these points is in hand under Professor Carmody's direction and will soon be forthcoming. Fowls eat the fresh roots without poisonous results following.—*Trinidad Bulletin.*

TOBACCO AS AN INSECTICIDE.

In answer to Mr. W. Lawlor of Sunnyside, Tenterfield, who asks for advice as to the most effective way of using tobacco (ordinary dried leaf) for insect pests, the Entomologist, Mr. W. W. Froggatt, says; It can be used in the two following ways:—For aphis, the roots of the affected trees are bared, and the tobacco, ground to powder, is dusted well over the roots and ground about them. A ring of tobacco dust is put round the trunk of the tree just below the surface. The earth is then thrown back, and when rain comes the nicotine is washed out of the tobacco, and gets spread over the roots, killing all black or woolly aphides with which it comes in contact.

Secondly, as a wash: 1 lb. of waste tobacco will make about for gallons of wash, and ½ lb. of soap is added to make it more adhesive. The leaf can be steeped in cold water over night, and the soap boiled up and added; but most orchardists boil up the leaf and soap together, straining the resulting liquor and applying it hot. Tobacco is a contact poison, and is the best known remedy for soft-bodied things like aphides, but it does not affect scale insects very much, when they are full grown and protected by their shelly outer covering. If tobacco wash could be sprayed on to the larvæ of scale insects it would destroy them wholesale.—*The Agricultural Gazette of New South Wales.*

TOBACCO CURING

A year or so ago I ventured to recommend to our Himalayan planters' attention the Sumatra variety of tobacco plant, on the grounds that it grew remarkably well in good soils in the hills, and had proved itself exceptionally hardy, producing during the monsoon season a very fine plant with beautifully fine texture leaves. Of this there is not the slightest doubt, provided the soil is good, the rainfall not too heavy, and the soil does not come waterlogged. I find, however from correspondence and notes in various planting journals on this side, as distinguished from Madras, that the trouble is that of manufacture. This likewise I found out for myself, for although I had no difficulty in getting a fine plant, and none in hanging and ripening the leaf, yet when it came to the necessary fermenting a difficulty at once presented itself more especially as to the extent and degree of the ferment,

I am strongly of opinion there are thousands of acres of admirable tobacco lands in the hills, and that the Himalayan regions should certainly during the monsoon produce a very superior tobacco, more especially as after the rains the weather is perfectly ideal for curing operations, collecting, and so forth.

Some time ago I saw a writer put forth the assertien that Gauhauti could produce tobacco fully equal to that of Havannah. If there is anything in this assertion it is high time the planters of those parts woke up to the fact that tobacco of the quality produced in Havannah would fetch money and plenty of it to insure the business being highly profitable. This apart, however, increasing quantities of both Java and Sumatra tobacco are no doubt being bought for the covering leaf of Indian-made cigars, for, however much the makers may puff Indian cigars, their first and chief recommendation, without Sumatra and Java covering leaf, is simply cheapness.

The time was when the British public went to China for the sum total of its tea, but India has totally altered that state of things; and why it should not produce all the tobacco it requires for its own consumption and some for export to boot is a thing I do not understand. Here is a country with a perfectly marvellous range of climatic conditions and soils, and yet quantities of Java and Sumatra tobacco are imported, and American-grown tobacco is no doubt being increasingly imported into this country.

Coming to the subject of curing, I have before me the latest revised edition of the Bulletins on the tobacco industry in the United States, bearing date 1898, in which are set forth the methods practised in many parts of the United States by one of the chiefs of the United States Agricultural Department.

It may be stated at once that of the fermenting processes "very little is known about the chemical changes that occur in these processes." Again, there is a strong feeling among the more intelligent planters that more information is needed upon the changes which take place in order that these may be carefully controlled. After a careful perusal of the American publication I have no difficulty in forming the conclusion that you can no more make a good tea-maker from book reading than you can a tobacco-curer. It has to be systematically learnt from observation. Indeed it is stated that even an expert cannot lay down written instructions that will be certain to guide the operator aright. For the information, however, of planters, it may be stated that the farmers or planters of the States in a very large measure sell the tobacco uncured; turning it over to the manufacturer for curing. In this case the *modus operandi* is briefly as follows:—The crop is planted in rows of 3½ to 4 feet apart and 18 to 24 inches from plant to plant, it is topped from fifteen to eighteen leaves, and suckers taken off from time to time, that is, as I understand, in this case the side shoots and any emanating from the ground around the main plant. In cutting the plants a general average is struck, and the plants cut when the middle leaves are ripe. The plants at cutting time are laid on the ground to wilt for an hour or two, and turned if necessary to prevent scorching, and it is material the day of cutting be a fine dry one. After wilting sufficient the plants are attached to laths and slung up in the withering barn, which is quite tight but provided with ventilators for ventilation until the tobacco is thoroughly wilted. When thoroughly dried, which is at the outside in two months, it is taken down; the leaves stripped from

the stalks and piled in heaps. It is explained that it is taken down during a warm damp spell. Supposing the damp spell did not occur, I apprehend it could be produced by injecting hot vapour into the barn or shed. The heaps are then covered over with sacks or cloth to keep them in "order" which means a moist condition in which the leaves will not break. The leaves are then packed in boxes lined with strong tough paper, which is also tightly wrapped over the top before closing. In this state a great deal is sold to the curing or manufacturing establishments. Some growers, it is added, carefully sort the leaves and get 3 cents a lb. more for it. Here it will be seen is no question of fermenting for the grower, that being done by others

In the matter of fermenting there appear several methods, of which the following is the first. The sweating is done in wooden cases holding 300 lbs. of tobacco. About half an inch blank is left between the boards to allow moisture to escape. The boxes are then filled with leaves packed with thick ends outwards; they are then tightly pressed down to exclude air as much as possible and the top is screwed on the box. The boxes are piled up in the warehouse, and there left all through the winter and the following summer; being merely changed in order once or twice, *i e*, the bottom box is placed at top and all the boxes turned upside down. This, in brief, is apparently the simplest method of all. It is added that the warehouse temperature is kept pretty uniform during the winter and sometimes the tobacco is overcured, and sometimes undercured. "Nothing in point of fact is done save to maintain the temperature of the room moderately uniform."

In Florida, however, where the Cuba and Sumatra kinds are somewhat extensively grown, the process is entirely different. To begin with, the leaves are gathered as they ripen and not all at once; this for the Sumatra kind; the Cuba plant is cut as already described. When dried, as in the case of other kinds, the leaves are piled for the ferment, and this may be done on the floor or in bins. The room is then kept very moist, and the temperature also very high by artificial means, as may be gathered from the following:—"The temperature of the room is kept quite high and the vapour from the bulk which is being worked over is very pungent and almost overpowering. There is a strong odour of ammonia which makes it difficult to breathe." The bulk is watched incessantly and as the temperature rises the tobacco piles are torn down and rebuilt, each hand of tobacco being shaken out to cool it, prevent sticking and dry it somewhat. Before the sweat is completed the piles are pulled down in similar fashion eight or ten times. The exact time when they should be pulled down and rebuilt depends entirely on the rise of temperature and the condition of the tobacco, which can only be determined by the operator, but the temperature of the pile is allowed to rise gradually until it occasionally reaches 180 F., this representing the maximum, from which the pile slowly recedes until the temperature of the room is reached, and this temperature of 180 F. must be reached gradually.

For the wrapper leaf, the temperature should not go too far, but for the filler, the further it goes and the more intense the action the stronger and finer will be the tobacco, if well done. When the process is completed the leaves are very carefully sorted into grades and packed into either bales or "Carottes" (cylindrical rolls). The fillers, that is, the leaves reserved for the interior of cigars, are frequently re-sweated in order to bring out the fullest quality and also *petuned*. What may be the scientific meaning of *petuned* (the word itself) I am unable to say, or what language it is derived from, "but sophistication" will fit the case very well, as the following shows:—"The essential part of the *petuning* liquid is a thick infusion of tobacco stems of the finest quality obtainable. To this is added molasses, cider, Jamaica rum or sour wine." Other matter is also added, but is a secret of the Cuban makers which they are unwilling to divulge.

After this the bales are piled in the warehouse, and the temperature of the room kept rather cool, and there the tobacco should remain at least two years, "and the longer it is left to age the better it becomes." Other modified methods there are, but it would appear much depends on the ferment, and pulling the piles to pieces the moment there is any danger of over-fermentation: and likewise preventing a too rapid fermentation. In every case the leaves would appear to be bulked to a considerable extent either on the floor, in bins, or hogsheads; and when the tobacco has run the course of the ferment it is so far complete.

In the case, however, of the celebrated Virginia tobaccos, the modification is so considerable as to constitute another method. The leaves are taken straight away to the barns and hung up. These barns have flues running through them, and the moment the leaves are hung quite fresh, the fires are lit up and heat gradually increased without check day or night until it reaches 80 or 90 degrees and maintained at that until the leaves turn a bright yellow, which is in the course of from 18 to 36 hours, and requires very close watching for the correct colour. After this stage is reached the temperature is increased hourly five to 10 degrees until it reaches 115 to 120° at which it is held until complete cure of leaf is effected, after which the temperature is slowly run to 160·175° for the purpose of curing the stalks.

TYPES OF TOBACCO EXPORTED.

The United States export an immense lot of tobacco to many countries: among them I find the following (the observations appear to me not altogether devoid of a species of humour):

1. "The German type is a very fat heavy-bodied leaf, strong, tough, and elastic . . . a fat leaf is always demanded."

2. "The Italian type is a little lighter in colour than the German, very smooth and silky, not so fat, but of good length.

3. "The Austrian type is slightly lighter in colour than the Italian, but the two types grade into each other so that no sharp lines can be drawn."

4. "The French type of tobacco is lighter in colour . . . thinner of body, not so fat; has little elasticity, and in most ways is a poorer grade of leaf than the three types just described."

5. "The Spanish trade takes a large quantity of nondescript and low-grade leaf and luges of all types, colours, and textures, very little good leaf is called for."

Lastly come our gallant Jack Tars, thus:—"The heaviest type of tobacco goes to England for use in Navy Plug. Sailors require stimulants, and the heaviest of tobaccos carrying a high per cent. of nicotine are used in Navy Plug." NICOTIANA.
—*Pioneer*, Sep. 15.

CHILE PEPPER CULTURE.

Mr. J. B. Neff, of Anaheim, California, discourses on Chile pepper culture, in the *Califonia Cultivator*, on the basis of his own experience as a successful producer of hot stuff.

How Plants are grown.—A hot bed is made by excavating about 16 inches deep; fill in to within 4 inches of the top with damp stable manure, tramping down very solidly. Spread about 4 inches of sandy loam over the manure. The seed is sown quite thickly over the loam, and then about ½ inch of loose, sandy soil placed evenly over it, and all kept damp. When the plants have two or three leaves, thin to 1½ inches apart each way. The plants must be watered while in the hotbed by sprinkling. Great care should be taken to protect from frost.

Soil and Preparation.—Rich, sandy soil is the best for the Chile pepper. It should be ploughed deeply, and be put in a state of thorough cultivation. Ridges should be made 3 feet apart, and the plants set 2½ feet apart on the ridges. All plants must be on

a water line, and to get this the ridges should be made, water run down the furrows, and the plants placed about 2 inches above the water mark. This insures every plant receiving water when irrigated. Plant as soon as danger from frost is past.

Cultivation.—Frequent cultivation is necessary until the plants get too large to allow of a cultivator and horse passing between the rows. All weeds must be pulled out. When the plants are set as before noted, all the ridge will be on one side. This must be worked down with a cultivator, and then a plough used to throw earth on either side of the furrow, so that the plants will be midway on the ridge.

Irrigation.—While the plants are small water will be needed about once in twenty days, but as they get larger it will be needed as often as once a week, though only in small quantities. The plant seem to have no deep roots, consequently the surface soil must be kept damp.

Picking.—The field should be gone over about once a week after the peppers begin to ripen, all that are fully ripe being taken off. Great care must be exercised to pick all the stem with the pepper. They should be allowed to lie in the sun one day after being picked in order to toughen the stems and prevent them breaking during the process of curing.

Stringing.—The common method is to cut strings of strong, smooth twine 8½ feet long. Draw this through a needle about 10 inches long, which is often made of a bicycle spoke. Peppers having any breaks r blemishes must be thrown away, as they would oecay before drying properly. Of course, where an dvaporator is used these can be saved. After the etrings are full and tied they are hung on nails sriven into a rough pole or other framework standing dbout 6 feet from the ground, and left until dry; ar if shelter is available they may be moved before oecoming fully dry and hung closely together under buch shelter, but where there is a free cultivation of air.

s *Evaporating.*—Many growers prefer evaporating instead of drying. The evaporators used are of various designs and sizes, but they should be large enough when the peppers are dried on strings to hold not less than 500 strings. The usual plan is to have a furnace with several turns of 8 to 10 inch pipe in the basement, the peppers being placed in the second storey over a very open floor and with good ventilation. The temperature must be kept at 110 degrees Fahr., and in this way the house can be refilled about every four days.

Yield and Price.—Both of these, of course, vary with the season, soil, and water-supply. Two hundred and fifty strings of 5 lb. each is called a paying crop, but with all conditions favourable, including a late, warm season, as high as 400 strings, or even 2,400 lb. per acre, of dried peppers may be grown. Prices range from 35 to 75 cents. per string if sun-dried, and 7½ to 12½ cents. per lb. if evaporated.—*Planting Opinion.*

A DOUBLE TRAGEDY.

Down from a twig on a Northern Spy tree
A canker-worm swung in security;
He'd eaten all season since first he was hatched,
As a ravenous glutton he couldn't be matched.
He slipped inch by inch to the grass-covered ground,
Where he thought safe concealment mightly surely be found
In which he could pupate till autumn set in;
But a hen came that way and she gathered him in.
Gathered—gathered—gathered—she gathered him in.
She gathered him in, and his final rest
Was there, in there, in her well-filled chest;
And she strolled around in search for more,
For it tasted better than aught before.
But I thought of her end, her final act,
When the farmer'd slice with a carver's tact,
And remark, as each piece made him look less thin,
"I gather her in, I gather her in,
Gather—gather—gather—I gather her in."
—*American Agriculturist.*

TEA IN THE PARIS EXHIBITION.

Tea is well represented at the Paris Exhibition, and vigorous efforts have been made by various sections of producers to bring their produce under the notice of visitors, says a correspondent of the *Grocer.* China is, as might be expected, in the background, and although there is a fair representation of the ordinary products of that country and a good Chinese pavilion, tea by itself does not receive any special or adequate representation. Close to each other in the Colonial portion of the Exhibition, near the Trocadero, Japan, India, and Ceylon all have pavilions for the supply of cups of tea to visitors at moderate charges, and there is some interest in contrasting the different ways in which the teas of each have been put before those likely to wish to make use of them.

As might be looked for with a land which has recently and most rapidly adopted the civilisation of the West, Japan is well forward in methods for attracting attention to its products. The beautiful pavilion is surrounded by a garden in the Japanese style, planted by gardeners brought over from the Imperial gardens in Tokio, in which there is a pagoda (an exact representation of one of the celebrated temples in Japan), and some striking and interesting specimens of Japanese art, architecture, and industry. There is a separate tea-house, the operations of which are conducted under the organisation of the Guild of Tea Merchants of Japan. The fabric is of light woodwork framing peculiar to Japanese houses, and the garden is surrounded by woodwork railings, the whole being dainty and characteristic. The method of serving the tea is much the same as in the pavilions of the other producing countries, but it is somewhat suggestive of the Oriental wisdom and shrewdness generally associated with the wily Mongolian. The menu presented to visitors affords a much greater range of selection, as well as variety in price, than do those of the Indian and Ceylon pavilions. The card itself is well got up, printed in French on one side and English on the other. It offers a choice of the black tea and the green tea of Japan, also of the Oolong of Formosa, and for the small sum of 50 centimes a daintily-served cup of tea, with cakes, can be obtained. For 1 fr. the same is supplied, with the addition of a small souvenir present and a packet of tea, to be taken home. The latter is Japan tea of most excellent quality, and, if one is partial to a drink of the kind, is likely to impress favourably. Of course it is absolutely different in character from the black tea of India and Ceylon; in fact, the difference between the infused liquor of an ordinary Japan tea, as contrasted with black teas such as are drunk in England, is greater than that between ordinary tea and coffee. With the sample of tea is given some literature on the subject, printed in French on Japanese paper.

On the first floor of the tea pavilion there is a saloon reserved for the service of ceremonial tea, in the style followed in Japan. An afternoon call there is a serious thing, requiring ample time, and of the latter a large part is occupied in serving tea elaborately. The tea used for this is of a particularly fine and delicate character, being apparently little more than the dust which covers the golden tips on the points of the young leaves. It was said to be worth 30 fr. or 40 fr. per lb, and was of a very small make, the size being something like the very smallest and most powdery dust, and the colour deep green. A Japanese lady in attendance makes and serves this, and visitors take their seats on a dais, cross-legged in Japanese fashion, while the lady from Japan sits in the middle with an assortment of brushes, dusters, and tea-cloths round about her, so as to produce an absolute cleanliness in all the utensils. Each part of the process is conducted with the utmost care, and when the tea is finally prepared for drinking, it is passed round in a peculiarly formal manner, with elaborate bows on both sides, and has to be drunk out of a basin in a fashion which one must see to understand.

The Indian pavilion is part of the general exhibition given in the Indian Palace. The building is a very beautiful and characterisitic one, but there was grave delay in its completion and in the opening of some sections of it. That portion set apart for the sale of cups of tea is comparatively limited, and is not particularly well situated for attracting attention, but it is very daintily fitted up. The table service as to the cups, pots, &c., used is excellent. The tea is made in the best possible manner, and the tea supplied for consumption, while still remaining pure Indian, is not obtrusively pungent in its character, and very well suited to impress favourably those who already like tea and may want to contrast the tea of one place of origin with that of another.

The Indian tea-room has the advantage of having a number of beautiful trees actually growing in it. Those in charge endeavoured to buy up the right to cut them down, which the Exhibition authorities would not sell, and it is fortunate they did not do so, as in the height of summer they give a grateful shade and add much to the pretty effect of the place. The tea is served by waitresses speaking several languages, who are very beautifully dressed in costumes which, although not strictly having any relationship to India, are Oriental in their general character, and of a design and in a style which suggests that they might have been furnished by Liberty & Co. All are dressed alike, but the costumes appear to be varied from day to day. Although the tariff was somewhat higher than in the Japan tea-room, excellent value was given in the quality of the tea and of the biscuits, &c., supplied, and this exhibit might be considered a very fair bid on the part of the Indian tea people to popularise their produce among the visitors to the Exhibition. A considerable number of those seemed to appereciate the advantages of an afternoon cup of tea, but it was not very clear whether they were French people experimenting in what to them was a novelty, or visitors from other lands who were merely following "their custom of an afternoon."

Closely adjoining—in fact, practically part of the same block of buildings as the Indian Palace—is that of Ceylon, by no means so beautiful in its design and execution or in the wealth of characteristic detail, yet serving its purpose as a shelter for the representation of the products and industries of the island. In this instance the pavilion for serving cups of tea is right outside, in a separate building, with large accommodation in the way of al fresco tables and chairs, much in the style of any ordinary French cafe. A few Cingalese men, with their characteristic tortoise-shell combs in their hair, and dressed in the usual white cotton costume of Ceylon native servants, assist in supplying the tea; but the waiting is mostly done by waitressess, who might be those of an "A. B. C." shop in London. The trade being done is at times very large, and every seat seems occupied. A small orchestra plays in one corner to attract people, and this seems to answer its purpose very successfully.

The tea supplied on the occasion of my visit to the Ceylon pavilion was neither so good in itself, so well made, nor so daintily served as the competing pavilions, and the value given for money was inferior to that in either of the other two, but that appeared to be of little consequence. Ceylon tea has been so well advertised, not only throughout the Exhibition, but throughout Paris in general, and the situation (being at a point where many footways meet and cross) being a very desirable one, there is no necessity to give more to the customers than they expect. A very large trade was being done, and apparently many of the visitors were French people, and numbers had frequently to be turned away.

Ceylon tea generally throughout the Exhibition was being exceedingly well pushed in the restaurants, the Ceylon Commissioners having made contracts with most of them to supply pure Ceylon tea, and a neighbouring restaurant (with a familiar English name) had actually gone the length of cutting under the rates charged at the tea pavilion to attract people into their place for cups of Ceylon afternoon tea.

In Paris generally tea has certainly been more in evidence during this Exhibition than ever before, several well-known English concerns having opened depots, and a large number of places having been induced specially to push certain Ceylon teas that were being exhibited.—*Indian Gardening and Planting.*

PLANTING NOTES.

PRODUCTIONS OF THE JEWISH COLONIES IN PALESTINE AT THE PARIS EXHIBITION.—We are informed by Mr. S. Eldod, manager and director of the Palestine Wine and Trading Company, Limited, whose business premises are at 11, Bevis Marks, City, that the Jewish colonies in Palestine have obtained at the Paris Universal Exhibition of 1900, a Gold Medal for their wines and Grape-brandy, and a Silver Medal for fruit-trees and fruits.—*Gardeners' Chronicle.*

COOKING OF VEGETABLE-MARROWS.—As the season of Vegetable-Marrows is now with us, here are two very good modes of cooking them, sent us by Dr. E. Bonavia :—" *(a)*. ' Young Marrow Parmesan Fashion. —Take as many very young Marrows as you require, cut each in four, lengthwise; stew them with butter, without water, adding salt, till they are quite soft; place them on a hot dish, and powder them rather thickly with grated Permesan cheese. In the same saucepan put a large spoonful of good stock or gravy; mix in the pure of two or three large tomatos; pour this sauce on the Marrows, and serve. *(b)*. Young Marrow, Milanese Fashion.—Cut the number required in halves, lengthwise; half boil them in water and salt; remove the interior of each half, chop it up, and squeeze it in a clean rag to remove the water; then fry a chopped Onion in butter, adding the squeezed pulp, thickened with a little flour, and add a tablespoonful of cream, if handy; season with pepper, salt, nutmeg, and grated Parmesan. The whole should be as thick as porridge. When cold, bind the whole with a whipped egg or two. Fill the Marrow-shells with this stuffing; sprinkle over them some grated Parmesan, and bake to a light brown. N.B.—A variation of this is the addition of minced-meat and Sultana-raisins to the stuffing."—*Ibid.*

FRUIT IN CEYLON.—The attempts which have been made in the past to cultivate fruit on a large scale in Ceylon have not been of so encouraging a nature that hopes may be entertained that we shall see Orange orchards and fields of Pines filling our markets with a cheap and abundant supply of two of the best fruits Europeans can eat in the East. Oranges remain scarce and dear, which might in the gardens of the village around Colombo alone be grown without trouble and in abundance to fill all the requirements of Colombo, and the constantly increasing number of steamers and ships putting into our harbour. It is possible that the attempts which have been made in the past to cultivate Oranges on a large scale resulted in a failure on account of the class of plants chosen not being best suited to this climate, and whilst it is most desirable that better strains should be introduced, the Oranges which are in small supply in Colombo are not by any means undesirable in quality, but the quantity first requires attention. The Pines usually offered for sale in Colombo are of a very poor description, yet what Ceylon can do in the shape of Pine growing is shown by the delicious fruit to be secured by paying an increased figure. We are rather sanguine that were a start made by encouraging villagers round Colombo to plant the best strain of fruit trees, the results would very amply repay the time and money expended.—"Times of Ceylon."

THE CAMBRIDGE EXPEDITION TO THE MALDIVE AND LACCADIVE ISLANDS.

The last of the three scientific expeditions which have left the University of Cambridge during the past two years for work in various British dependencies has recently returned. It may be remembered that in April, 1899, an expedition left for the purpose of investigating the formation of coral reefs in Ceylon, the Maldives and Laccadives, under the charge of Mr. Stanley Gardiner, Balfour Student of the University.

After several weeks in Ceylon, three months were spent in the island of Minikoi, the most southern of the Laccadive Islands, the lighthouse of which is usually seen by travellers to the East about a day and a half before reaching Colombo. This island has obtained a very unenviable notoriety on account of the large number of wrecks on its reefs, the last of which were the steamship "Thrunscoe," which went ashore shortly before the expedition arrived, and the yacht "Tolna," belonging to Count Festetics, at the beginning of this year. It has long been proposed to erect a signal station on the island, as it lies in the direct route from the Red Sea to Colombo, Australia, and the Far East. From this point Mr. Gardiner cannot see that there would be any difficulty in communicating by means of Marconi's apparatus with Southern India, or, better, with a station on one of the higher mountains of Ceylon.

The members of the expedition took up their residence in a native bungalow, which they had erected close to the lighthouse, and from this centre carried on work of a very varied nature. The natives were not friendly to the English, on account of the disputes which have arisen after the various wrecks on the island though they were in no way actively hostile. The population numbers about 2,500 adults, of whom less than 900 are men, the greater number of the native males being absent on voyages. Many of them are employed on board the various English steamers which sail from Calcutta. The thorough survey of the island and its reefs made by the expedition revealed the interesting fact that the island had been recently elevated to a height of about twenty-five feet. Considerable attention was also paid to the currents round the reefs, which were found to be very varied, and large collections of the land and marine fauna were obtained.

In October Mr. Gardiner, accompanied by Mr. Forster Cooper, proceeded to the Maldive Islands, where they were very kindly received by the Sultan, who is locally known as the Sultan of the 12,000 Lands. The group was found in a ferment owing to a recent change of Grand Vizier and the removal of Mr. Nusserwanjee Dadabhoy by her Majesty's ship "Marathon." Owing to these causes considerable opposition was shown throughout to the work of the expedition by different Ministers and nobles. The Sultan, however, lent a schooner of about 18 tons, and did everything in his power to assist the work, despatching a Royal proclamation to every part of his dominions.

The group, it may not be generally known, is about 500 miles long, and consists of a perfect maze of small islands and reefs. It has passed successively into the hands of the Portuguese, Dutch, French and English, the old treaty of friendship and alliance with the Dutch being renewed yearly with the Governor of Ceylon by mutual presents of local produce to the value of about £20. Owing to disputes arising out of the wreck of a German vessel, a second treaty has, however, lately been made in respect to salvage. The people are Mahomedans of mixed Cingalese, Arab, and Malay stock, and the Sultan claims to have been given his title at Damascus by a former Caliph. All trade has to be carried on at Male, the Sultan's island, except in Maldivian vessels, and a small fleet of schooners is run by various Bombay merchants in Colombo. Rice is the principal import, no grain having been in recent years grown; and coconuts and dried fish, a kind of "Bombay duck," are given in exchange. Steamboats seldom visit the island on account of the strong currents and numerous reefs, which are constantly growing up or being washed away. Indeed, the navigation of steel ships is practically impossible except in bright sunny weather. A good instance of this was seen on the occasion of the visit of her Majesty's ship "Marathon" in 1899, when, in passing out of Male atoll, she stuck for some time on a reef, which was supposed to have at least seven or eight fathoms of water over it. A hurried survey of the group was made in 1836, but the people at that time were in a very disturbed state and few islands were visited. Since then practically no Europeans, except a few wrecked sailors, have visited any part of the group except the Male atoll, and nothing was known of the internal affairs or government of the many islands.

The expedition visited over 300 islands in every part of the group except the most northern atoll of Tiladummati, partly in the Sultan's schooner and partly in the steamship "Ileafaee," which was for some time chartered. At all the islands the members of the expedition went freely among the people, talked to them, and heard their legends and grievances. In everything their proceedings were the objects of the greatest curiosity, thousands of people who had never seen a white man before visiting their vessel. As far as possible observations were carried out, in particular on the currents of the group, and numerous soundings of the greatest interest were made. The positions of islands and reefs in the atolls were fixed, and all the latter were thoroughly dredged. Large collections, too, were made of the land and reef fauna.

On the whole, the work of the expedition, though the white members suffered severely from Maldive fever, was of a very satisfactory character. The government, mode of life, wants and relationships of the people have been investigated, and specimens of nearly all articles of native manufacture obtained. With regard to the reefs, it is hoped that these investigations will set many scientific points at rest in respect to their formation in the Indian Ocean. The collections, too, should once for all determine the possibility of there having been at one time in this region a large island, which has been repeatedly called into existence to explain the present distribution of animals and plants. It is hoped to communicate some of the results of the expedition to the meeting of the British Association at Bradford in September.—London *Times*, Aug. 18.

JIPIJAPA OR PANAMA HATS.

Ecuador is the real home of the hats wrongly designated under the name of "Panama," and according to the *Recueil Consulaire Belge* this industry afterwards extended to Peru and other countries, even to Yucaton in Mexico. Everywhere in Latin America the hat is known under the name of "Jipijapa" in honour of the city

where its manufacture was first started. It is only in Europe or outside of the producing countries that this hat receives the name of a city which does not make it. The finest hats are made in Jipijapa and at Montecristi, in the province of Manabi (Ecuador), this industry being one of the greatest resources of the country, The *toquilla* or leaf of a small plant is used for this purpose. It grows abundantly in the country the leaves coming up in the shape of a fan. The plant is the *Carludovica palmata.* There are jipijapas of all qualities, from those costing a few pence to those worth several pounds. The merit of these last, really marvels of fineness, consists as much in the scarcity of the straw as in the difficulty of the weaving, and therefore it is exceptional to find these hats on the general market. The hats of current sale cost a few shillings, the finest not exceeding from £5 to £6 in price. In buying a Panama it is necessary to ascertain two things—that the straw is whole and that it is not stiffened. It is not easy to recognise this first condition. In order to make two from one, the weavers split the straw with such perfection that unless a person is accustomed to such examinations it is almost impossible for him to distinguish the difference. Of equal fineness the hat made from whole straw is worth three or four times the one manufactured from the straw that has been split. The second condition is easily recognised for the hats are stiffened to make the straw firmer and white. Good *toquilla* is white and stiff enough not to need any gum, and only ordinary Panamas are stiffened.—*Journal of the Society of Arts*, Aug. 17.

COLOPHONY AND TURPENTINE.

The Forest Department have recently erected a distillery at Nurpur, Punjab, for the manufacture of rosin and turpentine from the crude oleo-resin which exudes from the *Pinus longifolia*, a tree which occurs plentifully in the Western Himalayas and less so in the Eastern. The trees are tapped by cutting wounds in the main trunk and suspending small earthenware cups for the reception of the exuding resin, the wounds being extended when they cease to flow. The samples produced in the factory are very good, the rpentine being quite colourless and the rosin being pale and clear. The Forest Department possesses, of course, a decided advantage in having no difficulty about trees to tap, but arrangements might be made for the tapping of forest trees on payment of a fee to the department. The business must be a lucrative one, as the department has furnished their factory with copper plant at a considerable expense.—*Indian Planters' Gazette*, Aug. 25.

THE COFFEE CROP IN COORG.

An estimate of the coffee crop in Coorg for 1900 has been received from the local Administration, and the figures are appended, with the estimates of 1899 for comparison :—

	1899.	1900.
	Tons.	Tons.
Estimated yield ($1\frac{1}{2}$ cwt. an acre for Europeans in 1899 and 2 cwt. in 1900)	2,089	2,751
Estimated yield ($\frac{1}{4}$ cwt. an acre for natives in 1899 and $\frac{1}{2}$ cwt. in 1900)	683	1,120
Total ..	2,772	3,871
	cwt.	cwt.
Estimated average yield per acre of ordinarily well cultivated coffee in full bearing ..	2	$2\frac{3}{4}$
	Tons.	Tons.
Export of coffee taken from the toll gate returns	4,134	2,366
Average annual export of coffee in the ten preceding years ...	3,228	3,326

Taking the average crop to be about 5,100 tons the estimate of 3,871 tons for the present season represents about 76 per cent of the average against 53·3 per cent in 1899.—*Indian Gardening and Planting.*

TEA :—THEA OR CHA.

WHAT CHINESE DRS. SAY.

"The Chinese physicians say that upon the mountain Tiengo grow above one hundred sorts of Simples all of very sovereign virtues. But, amongst all others, China is famous for a herb called Thea or Cha, and whereof the natives and other neighbouring people make their drink called Thea or Cha, taking its name from the herb. Of all the places in China this herb grows fastest, and in greatest abundance, in the province of Nanking, near to the city of Lucheu, and indeed the same is only found in China, Siam, and in the island of Japan. The leaves thereof are very like unto those of Sumack, and that this is a sort of Sumack noue need to doubt. However, it springs not wild, but by manuring; is no tree nor herb, but a bush or shrub, which they plant upon little hills three feet asunder, and grow as high as a Rosetree, the branches whereof are full of flowers and thin leaves of a dark green colour, which, though they differ not in shape, yet they are of several sizes, for upon one shrub are at least of five several degrees in bigness. The first and biggest grow upon the lowermost sprigs; next to them follow those of the next size, and are lesser than the first, and so by degrees grow all the other sorts. But so much as these leaves decrease upward in bigness so much the more the increase in price, for a pound of dried leaves of the first bigness is worth five Dutch shillings, that of the second bigness is worth fifty shillings, but that of the third five guilders, that of the fourth fifteen, and that of the fifth and last bigness fifty. Yea, sometimes one hundred and fifty guilders a pound if well prepared. Upon the branches grow small green buds, which produce little flowers with white leaves, yellow within, and in bigness, fashion, and colour very like the flower of Sweet Briar, but different from it in smell. After that the flowers are shed, there remains a husk which contains a blackish seed, which, being sown in the ground, brings forth the third year new bushes, from whose leaves is gathered every year a rich harvest, and that in such places where it rains and snows as it does in Europe, so that it is probable enough that there might be bushes raised from that seed if it were sawn in some shady fruitful European soil. It is full of spreading roots, which run but shallow in the ground, and are good for nothing; but the leaves they gather every day, and, drying them in the shade, preserve them for their drink Thea, which they use instead of beer, not only at tables, but upon all visits and entertainments, and, which is more, whosoever has anything to dispatch in the palaces of the Grandees is presented as soon as he is seated with a cup of this liquor, which is always drunk, or rather supped off hot, according to the fashion of the ancient Romans, who esteemed more of warm than cold water. If at any time this liquor proves bitter to the taste they mingle a little sugar with it, and drink it to drive away drowsiness. But such especially find the benefit in drinking thereof who have overcharged their stomachs with eating, or discomposed their brains with too much strong drink, for it is a very great drier of gross humours and dispels vapours, occasioning sleep. It strengthens the memory, but increases gall if drunk in too great a quantity. In brief, they extol the virtues of this drink infinitely, and attribute their not having the stone or gout to this, as they term it, most noble drink, which we may believe the rather because in all our journey forward and backward we saw nobody afflicted with these distempers. There is a very great difference in the manner of preparing and using this liquor between the Chinese and those of Japan, for the Japonners beat the leaves to a powder, and mingle it with boiling water in a cup, which they afterwards drink off, but the Chinese put the leaves whole into a pot of

boiling water, which, having lain in steep for some time, they sip off hot, without swallowing down any of the leaves, but only the quintessence thereof extracted. Others prepare it with milk and a little salt mingled with the water, which is not so well approved; but, however prepared, it is not only drunk in China and other parts of India but is much used likewise in divers other countries, and the general consent of all people that they find much goed by it enhances the price, and makes the same to be sold here at a very dear rate.—*Extract from an Embassy from the East-India Company of the United Provinces to the Grand Tartar Cham, Emperour of China, 1669. . . . English . . by J Ogibbt, Esq., Master of his Majestic's Revels in London."—Gardeners Chronicle.*

SHELLAC.

There seems to be no reason why the *Coccid, Tachardia lacca* should not be artifically propagated. Were plantations of the trees upon which lac is formed, among which are *Butea frondosa*, *Zizyphus xylopyra*, *Mimosa* sp., *Erythrina* sp. and *Croton laccifera*, made in suitable localities, there is every likelihood that the artificial protection of the eggs and the careful distribution of the same would lead to the increased production and facility of collection of lac. Exactly as one of the wax insects, *Ericerus peta*, which is closely allied to *T. lacca*, and has the same habits and transformations, is cultivated in China, so might this species be worked to advantage in India. More difficulty is indeed attached to the rearing of the wax insect in China than would be found in the case of the lac insect. The Chinese in the district of Szechuen, where the wax insect produces best, collect the eggs from what is supposed to be a more healthy district for their oviposition, *viz.*, the region of Been-Chang. The producers carry the eggs over mountainous country to the more suitable district for wax production, the distance between the places occupying about a fortnight to cover. The eggs are then tied up in small bags and suspended from the twigs of the evergreens, on to which the newly-latched larvæ swarm and subsequently produce a coating of wax in the same manner that the lac insect produces lac. Both the gum lac and the dye made by the insects are marketable products.—*Indian Planters' Gazette*, Aug. 25.

AGRICULTURE AND CHINA MATTING.

(*From an ex Ceylon resident.*)

Manila, Aug. 17.

The Civil Commissioners take over power here from General Macarthur, the Military Governor, next month, and one of them will start an Agricultural Department, but I am afraid they will be long in starting Experimental Gardens.

You will see by the paper I am sending that the Government have selected a site for a Sanitarium on the Benguet hills. It will be reached by rail from Manila to Dagupan (across Luzon) and a small hill railway is to be made from Dagupan up the hills. I am afraid it will be two years before this line is made, as everything is done very slowly. Manila is improved since the American occupation, but there is plenty of room for more improvements, especially in the roads. Bad road metal is put down and rollers are unknown.

A SANITARIUM FOR LUZON.

Luzon is to have a Sanitarium. It will be located up in the life giving mountains of Benguet at a place called Bogio, about 45 miles from Dagupan to which place it will be united by a mountain railroad, and all this will be done as soon as possible and within a year. Messrs, Wright and Worcester of the Civil Commission journeyed north to locate a suitable site for a Sanitarium. These gentlemen returned to Manila last Friday, filled full with praise for the Benguet country. In selecting Bogio for the proposed sanitarium, the commission had three very important matters in view, the first of which was, of course, a health resort. A place where, during the most oppressive months of the Luzon year, Americans and Europeans could go and rest and recuperate. For this purpose the place chosen is admirably situated. It is high in the mountains and contains an abundance of the purest, freshest water, the nights and days are cool, the scenery superb and inspiring. Besides the motives of health, the establishment of a summer resort here and the building of a railroad from Dagupan will be the means of opening up a wonderfully rich region, and will in this way prove a good political move, while from a military point of view such a step would be invaluable.—*Manila Times*, August 16th.

CHINA MATTING MANUFACTURING CO.

PROSPECTUS.

Capital, $1,000,000 (Hongkong Currency) divided into 50,000 shares of $20 each, of which $5 is payable on application and $5 on allotment. Head office Hongkong. This Company has been formed for the purpose of making by power-looms straw matting of the same description as that now produced by hand-looms in the neighbourhood of Canton (China.) The export of Matting from China to the United States has of late years become a most important trade, having risen in the last 10 years as follows:—from 179,472 rolls shipped in 1889-1890 to 370,170 rolls shipped in 1898-1899 but, as usual, the quality of the goods has fallen away with the increased demand, while prompt delivery to contract time has become increasingly difficult.

Many attempts have been made to devise looms which could be worked by steam to take the place of the crude hand looms used by the Chinese and Japanese, but success has only been attained by a loom which became the property of the Kobe Manufacturing Co., and which has since been brought to a high state of perfection by further inventions and improvements.

The promoters of this company, having experimented with a small trial plant of 50 of these power looms and introduced various further improvements suggested by their knowledge of the Matting trade and requirements of the market in the United States, are now satisfied that Matting made by such machinery must supersede that made by hand looms and have accordingly entered into an agreement with the Kobe Manufacturing Co, to acquire all the rights to the invention.

While experimenting with 50 looms, some 10,000 rolls were made and shipped and the reports on the later and better made shipments were all of a highly favourable and encouraging nature, the evenness of the fabric and the great improvement on the old hand-loom matting, especially as regards the selvage or edge, being particularly praised and commented on. One great difficulty was to get the machines to turn over the straw so as to produce a clean surface at the edges of the Matting. This difficulty was overcome some few months ago, and the looms can now, in the opinion of experts, turn out a perfect fabric. As each power loom can produce about 30 yards a day as against 6 yards produced by hand-loom, the saving in the time is obvious, while the advantage of being able to rely upon punctual delivery will be a great boon to dealers at home who at present have to put up with much delay and loss of time in getting their goods. The advantage is still more obvious to-day in view of the political unrest all over China and the great probability of the present troubles in the North spreading to the South, in which case the matting industry in the districts around Canton is likely to suffer to such an extent that it may take years to recover, matting being entirely dependent upon the labor of the peasant class when not en-

gaged in their ordinary farm work. It it proposed to erect a Factory capable of running 450 looms producing about 100,000 rolls per annum, of which it is estimated, at the prices recently obtained in the United States for the Matting sent there for sale, there would be a net profit of a least $1½ per roll, or say $150,000. In course of time further experience and economies will undoubtedly improve upon these figures. The promoters of this Company have, as before stated, experimented with 50 looms and having acquired from the Kobe manufacturing Company all the rights to the invention will transfer the same to the new company together with fifty looms and other machinery, stock in trade, good will, etc., for $350,000 (Hongkong currency), which amount will be taken by the Kobe Manufacturing Company and the promoters in shares. The capital of the company, as far as can be roughly estimated, will be laid out in the following manner:—Land, buildings and machinery, $470,000; working capital, $180,000; Kobe Manufacturing Company and promoters for rights, good-will and sundry machinery, including engine and 50 looms, $350,000 taken in shares.—Total, $1,000,000. —*Manila Times* Aug. 16.

ADDITIONS TO THE ZOO.

At the monthly meeting yesterday of the Zoological Society of London at the offices in Hanover Square, Dr. Henry Woodward, F.R.S., vice-president, in the chair, it was reported that there had been 137 additions to the society's menagerie during July. Among them special attention was directed to a fine pair of tigers (Felis Tigris) from Mysore, India, presented by H.H. the Maharani Regent of Mysore; to a sharp-nosed badger (Meles leptorhynchus), from China, representing a species which had not been in the society's collections since 1873; and to a young female brindled gnu (Connochœtes taurina), born in the society's gardens, being the first instance of this species breeding in the society's menagerie. It was also announced that the Right Hon. Cecil J Rhodes had presented to the menagerie a lioness which had arrived on the 11th inst. in the steamer Saxon, of the Union Castle Company, and that the company had kindly brought it from the Cape freight free.—*Globe*, Aug. 17.

GOLD CRAZE IN MADAGASCAR.

Paris, Aug. 17.—The discovery of gold in the Malagasy provinces of Imerina and Ambositra has generated a veritable craze in all sections of the population, irrespective of race or colour. All ties of business, family, and long residence in the capital and other centres are being uprooted, and there is a universal rush for the new El Dorado. The fever of speculation has already been productive of much misery. There is no doubt that there are gold deposits, but most of those found hitherto prove to have been almost exhausted by natives before the French Conquest. The gold region extends about 100 miles south of Antananarivo.—*Daily Express.*

CAPRIFICATION OF FIGS.

The process of caprification or cross-pollenisation of Smyrna Figs is performed chiefly by women and children; it consists in gathering the Profichi, and suspending them in the branches of the Smyrna tree, says *California Fruit Grower*. In the Meander orchards it is customary to string the hard Profichi on the ends of rushes, which are pushed horizontally through the sides of the Fig; if the Profichi are plentiful two are strung on each end of the rush, which is then thrown up into the Smyrna tree and caught among the branches. The fig wasp, on emerging from the Profichi, enters the Figs nearest to hand, not discerning any external difference between the young Smyrna Figs and the young Mammoni, which it would enter if still in the caprifig tree. But once inside the fig wasp discovers that something is wrong, for, instead of finding short-styled gall flowers in which it could lay its eggs, there are only female flowers with long styles, which are entirely unfitted to receive the eggs: insect is unable to escape, and in darting about in vain efforts to find some gall flowers, the pollen with which it was so freely dusted in emerging from the Profichi is rubbed into the receptive stigmas of the female flowers. The little wasp finally dies in the Fig without having been able to provide for the production of its kind, and on cutting open a Smyrna Fig shortly after caprification one can usually find the dead insect.

The quantity of caprifigs needed to caprificate a Fig tree varies with the size of the tree. In Smyrna some thirty Figs are required to caprificate a large full-grown, edible Fig tree.

TRADE IN BORNEO.

The report of Mr. Consul Keyser on the trade in Borneo has just been received. With regard to Brunei, it appears that there is a good opening for the collection and cultivation of rubber and gutta-percha, but the Chinese have practically killed the trade and driven the natives out of their country.

Sarawak, which is governed by Rajah Sir Charles Brooke, is, however, progressing rapidly, and the exports of rubber and gutta-percha from this district are increasing every year, as the following figures show

The reports being as follows:—

		1898	1899
Gutta-percha	...	513,200 lb.	1,362,267 lb.
India-rubber	...	515,333 lb.	664,133 lb.

These, with rattans, form the chief articles of of export.—*Indiarubber Journal*, Aug. 20.

LINSEED OIL-CAKE.

This product has long been known to gardeners in the country as a valuable manure for fruit trees, especially for vines and peaches; but its use has not been as general as its valuable properties warrant. Mixed with lime it has a wonderful effect on fruit trees. Judging from the reports on experiments carried out on the several Government experimental farms by the application of linseed cake to certain cereal crops, the conclusion to be drawn is that it is one of the best fertilising agents we have. As a cattle food and even for horses, its value is fully recognised in England and Scotland and hundreds of tons of it are imported annually from India by Scotch farmers, who are better acquainted with its valuable properties than the Indian *ryots*. As with bone-meal so with linseed oil-cake. Those out of India think more of it than the Indians, with the result that, instead of being utilised in this country for the manuring and fertilisation of crops, these valuable substances are being sent out of the country. It is a striking commentary on the peculiar conditions obtaining in India, that the people do not recognise the value of their own indigenous products, and allow foreigners to exploit them to their own advantage. Messrs. Barry and Co., Calcutta, are the Managing Agents of the Gourepore Co., Ld., and will be glad to furnish particulars as to the linseed oil-cake manufactured by the latter.—*Indian Gardening and Planting*, Aug. 30.

CEYLON TIMBERS.

Amongst tropical timbers there are some peculiar to Ceylon which occupy the first rank in importance, some even being unequalled in beauty and commercial value, *e.g.*, Calamander and Ebony. The Timber Expert for the Imperial Institute has recently made an examination of samples of Ceylon timbers and has pointed out in several cases the probability of certain kinds gaining increased favour in the timber market, more especially with cabinet makers. Some of the samples, however, at his disposal were from uncertain sources and of doubtful species; whilst with many the age of the trees from which they were obtained could not be determined. Obviously, the latter character is of vital importance in estimating the value of timbers. The age of trees grown in temperate climates can generally be distinguished by the number of rings to be seen in a transverse section of the stem, each ring indicating a definite period of growth, owing to one season of activity being followed by one of rest in the same year. In Ceylon, however, where the vegetation is generally evergreen and therefore comparatively uniform in rates of growth throughout the year, the idea of "annual rings" can no longer be relied upon as indicating the exact age of a particular tree.

The rates at which trees grow, and therefore the seasonal rings in their stems, are, to a great extent, controlled by climatic conditions; and since Ceylon, above all places, offers such a great variation in this respect, it is more than probable that if sections of trees from different parts of the island were examined, certain conclusions could be arrived at which would be capable of general application. The only way in which reliable information can be obtained on the point in question is by examining as many trees as possible, of known age. The knowledge thus gained can then be applied in solving the age of timbers about which no record of planting has been made.

In this connection we learn that Mr. Herbert Wright, the Scientific Assistant at Peradeniya Gardens, is giving special attention to the subject of annular rings and planters when felling any trees (in the hill or lowcountry—in the Puttalam and South Batticaloa districts, where coconut clearings are being made) would do well to forward to him thin sections of the same, about three inches in thickness. Mr. Wright, more particularly, wants sections of trees "of known age." Such, however, can only refer to timber trees planted on estates or around bungalows, and chiefly of imported —Australian, Indian or Japanese—trees. We have never heard of any planter trying to grow the cabinet-wood-yielding trees of the island, more especially Ebony and Calamander? If we are wrong, our good friends, Mr. W. H. Wright and Mr. Wm. Jardine, will correct us. Indeed, Calamander is inearly extinct in the Crown forests in the island. Here is what Dr. Trimen says in his "Flora":—

Diospyros quaesita:

Forests of the moist low country below 1,000 ft.; rare, Singhe Raja Forest; Hiniduma; Potapitiya, Kukul Korale; Karawita Kande; Ratnapura; Dotalankanda, Pasdun Korale. Fl. April. Endemic. This affords the finest of the variegated woods known as Calamander. The tree is much sought after, and, from being destroyed in many places, is becoming more and more scarce. Thunberg in 1777 first discovered 'Calaminder' wood to be produced by a species of *Diospyros* (see his 'Travels,' vol. iv.).

The shape and large size of the fruit afford a ready means of determining this species, and the venation of the large leaves is also characteristic.

And from the current "Agricultural Magazine" we extract a passage out of a report by Mr. A. F. Broun, Conservator of Forests:—

Ebony, as has already been mentioned, is found in small quantities in this zone, but the most important tree of this family, which is unfortunately almost extinct, the Coromandel or Calamander wood of commerce, *Diospyros quaesita*, is still found here and there in the Pasdun Korale and in the Hinidun Pattu. Attempts have been made for several years to obtain the fruit in order to propagate the species artificially, but, although rewards have been offered, none has been obtained.

Still another extract we take from the late Wm. Ferguson's pamphlet on "Ceylon timber trees":—

I recollect reading in 1819, a very interesting account by Mendis Modliar of the mode of procuring Calamander Wood, and the fact that the variegated part so much in request is an *accidental* product of the tree, some trees producing none of it, some near the lower part of the trunk, whilst in others it is found only near the middle of the trees, and generally not in luxuriant trees growing in rich soil, but in those growing in dry rocky ground. These remarks apply to several of the trees producing *variegated* or *ornamental* woods, such as the Tamarind, in which the beautiful Calamander-like wood is found only in very old trees, and generally in the heart of the lower part of the trunk, or in the roots; and the differences of soil, climate and situation have such an effect on the timber of the same species of tree, that unless these facts are taken into account respecting the specimens used as tests, the tables of strength, weight per cubic foot, specific gravity, &c., &c., are not to be depended upon. Again the times of felling, mode of seasoning, &c., should also be taken into account.

Nitrogen and Electricity.—Tesla says it will yet be feasible to procure nitrogen from the air in a form suitable for fertilising purposes by means of electricity. By transmitting electric power great distances without wires, Tesla also thinks that power will be made so cheap that it will pay to pump water for irrigating lands that cannot be otherwise utilised. Yet such a source of cheap nitrogen would be no more remarkable and not as practicable as the method by which every intelligent farmer now extracts nitrogen from the air instead of paying for it. Leguminous crops have the power to extract nitrogen from the soil's atmosphere by means of nitrifying organism or bacteria. These crops will thrive on poor land if dressed with a little potash and phosphoric acid, and then if ploughed under (in whole or in part), the nitrogen thus obtained is added to the soil's supply of plant food. The wonderful function of bacteria is just beginning to be realised in agriculture as in other industries. In this and other ways Nature will help intelligence as applied to farming, more readily and efficiently than to idly wait some transcendant discovery for the artificial extraction of atmospheric nitrogen.—*American Agriculturist.*

THE WALAWE ESTATES COMPANY.

RICE GROWING.

The *Government Gazette* contains the memorandum and articles of Association of this Company formed to take on lease and thereafter purchase or otherwise acquire the Walawe estate at Ambalantota, and prepare, manufacture, treat, and make marketable paddy, rice, tea, copperah, oil, and (or) other crops or produce.

The nominal capital of the Company is one hundred and twenty-five thousand rupees, divided into 205 preference shares of R100 each, bearing a cumulative preferential dividend at the rate of eight per cent. per annum, and also ranking in priority to the ordinary shares for return of capital upon a winding up of the Company and 225 ordinary shares of R100 each, the remaining 595 shares of R100 each to be issued hereafter in such manner as the Company may direct, with power to increase or reduce the capital. After the payment of the cumulative preferential dividend at the rate of eight per cent. per annum, and a cumulative dividend on the ordinary shares at the rate of eight per cent. per annum, the balance profits of any year which the Directors may recommend for division shall be divided and paid as to two-thirds to the preference and ordinary shareholders *pari passu*, and as to one-third to Edward Elliott so long as he shall be Manager of the Company, and upon the retirement of the said Edward Elliott from the management the balance profits shall be divided between the preference and ordinary shareholders *pari passu*. The signatories are :—H Creasy, Colombo, G H Alston, A Thomson, G W Carlyon, W Henry Figg, Whittall & Co. and *per pro.* E B Creasy, R E Shaw.

NYASSALAND COFFEE COMPANY.

THE ANNUAL REPORT OF DIRECTORS.

Directors :—Messrs. W P Metcalfe, Chairman; Geo. Kent Deaker, H Creasy and W Shakspeare.

ACREAGE.

10 acres coffee planted Dec. 1895.				
240	do	do	do	1896—Feb. 1897.
383	do	do	do	1896—Feb. 1898.
633 acres under cultivation.				
2,843 acres reserve.				

Total 3,476 acres.

The Directors beg to submit the accounts closing the year 1899, the period under review covering six months only.

Superintendence.—During the six months Mr. G N Barclay was in charge of the estate.

Progress of Works.—The ordinary routine work of the estate was partially carried out, but possibly owing to Mr. Barclay's unfortunate illness, the weeding, from latest reports received, would appear to have suffered from lack of supervision, Mr. Robins being absent on furlough.

Crop for 1900.—The issue of this report has been delayed in the hope that full information would have ere this been received, but the Directors regret that no details have yet come to hand as to the outturn. The accounts to the end of April show 42 bushels parchment coffee secured as the result of first pickings.

Financial Position.—To the 31st December, 1899, the Company was indebted to Messrs. Carson & Co. to the extent of R8,500, and they have continued to finance the Company during the present year. It has not yet been found practicable to conclude the arrangements foreshadowed in the last Director's report.

Directors.—Mr. W P Metcalfe retires by rotation but is eligible for re-election.

Auditor.—The appointment of an Auditor for the current year rests with the meeting.

DOOMOO TEA COMPANY.

THE DIRECTORS' REPORT.

Directors :—Messrs. W Kingsbury, F W Bois, W D Gibbon.

Your Directors beg to submit their Report and Accounts for the season ending 30th June 1900,

The tea received from the two estates aggregated 242,790 lb. against an estimate of 220,0 0 lb. and the price realized was 40·57 cents per pound against 42·83 cents per pound the previous season. The cost of production was however reduced by almost 4 cents a pound the resulting profit being 13·88 cents per pound against 12·22 cents.

The Doomoo Factory has been removed and re-erected at Verellapatna as a withering shed, and the whole of the Company's Tea is now manufactured on the latter Estate, this having been considered advisable owing to the rapidly increasing cost of firewood.

The amount available to deal with is R37,264·92 and your Directors recommend that R2,500 be passed to Depreciation account R5,000 to Reserve account that a Dividend of 7 per cent for the year be paid forthwith and the balance of R1,764·92 be carried to next account.

The Directors would also ask the shareholders to sanction the payment of a bonus of R500 to Mr. Mason for his efficient and economical working.

The estimate for the current season is 245,000 lb. Tea on an expenditure of R71,205—which includes a sum of R3,000 for a new bungalow which is necessary on Verellapatna.

The acreage of the two estates is as follows viz :—

Doomoo ...	210 acres	Tea 6 years old and upwards.
	3 „	„ 4 „ „
	6 „	„ under 2 years.
	219	
	22 „	Timber.
	58 „	Chena and Patna.
	299 acres,	
Verellapatna	345 acres	Tea 5 years old and upwards.
	120 „	„ 4 „ „
	35 „	„ 3 „ „
	24 „	„ 2 „ „
	524	
	10 acres	Grass.
	154 „	Chena and Patna.
	688 acres.	

In accordance with the Articles of Association Mr. F W Bois retires from the Board, but being eligible offers himself for re-election.

It will also be necessary to appoint an Auditor for season 1900—1901.

Nyassaland Coffee Company.—We regret to see that this enterprising Company is to be no exception to the usual experience of pioneers. But it seems to us cultivation has been forced on a little too rapidly: 663 acres of coffee would be a really big charge even in Ceylon: how much more in a new and like B. C. Africa. We think it a pity the Directors did not confine themselves to 400 acres as a maximum, until they had got profitable returns and proved the plantation to be a success. Then the weeding probably would not have fallen into arrear, while the financial position would have been distinctly better. However, we have no doubt all has been done with the best intentions and no Directors can guard against the illness of their Superintendents

PRODUCE AND PLANTING.

Russian Customs Tariff on Produce.—The Board of Trade have received, through the Foreign Office, a copy of a Russian Imperial Ukase, dated July 21, stating that the Russian Government have decided to increase temporarily the duties on articles comprised in certain sections of the Russian Customs tariff on their importation into Russia from European countries. The conventional tariffs existing in conformity with the treaties between Russia and other States will not be affected by the present Ukase, which was to come into force from July 23 (August 5)—*i.e.*, the date of its promulgation. In the list of articles liable to increase there is no mention of tea, but there is an increase of 50 per cent upon roasted coffee, cocoa, and spices, an increase of 30 per cent upon raw coffee, and 20 per cent upon ground cocoa.

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The Tea Trade of Canton.—An interesting report on the trade of Canton for the year 1899 by Mr. Scott, the British Consul, has just been issued through the Foreign Office. In his report Mr. Scott says: "The returns of tea given in the Customs returns convey no idea of the real quantities exported. In the case of tea, the information is positively misleading, as the figures show an actual decrease, while I am informed that there was really an increase of about 1,000,000 lb. as compared with 1898, which year, however, was the worst year, as regards the quantity exported, on record. The total amount exported to London is stated to have been 5,250,000 lb. This was all junk-borne to Hongkong for transhipment. The 1,130,214 lb. which appear in the Customs returns was none of it destined for the United Kingdom, practically the whole being consumed in China itself. The improvement in the trade last year is held to be temporary only, the whole course of the trade having a downward tendency year by year, and is gradually but surely diminishing. The requirements for the 1900 season are said to be only 4,000,000 lb. The result of the trade in 1899 is said to have been profitable to the producer, and more ground has been put under cultivation, but the increased quantity thus produced will all be required for consumption on the spot and for export to other parts of China."—*Home and Colonial Mail*, Aug. 24.

PLANTING NOTES.

American Maize in the Punjab.—A trial is to be made in the Punjab as well as in other parts of India of samples of American maize recently received from the Rev. R Winsor, Secretary to the American Board of Commissioners for Foreign Missions.—*Pioneer*.

A "Tea Cess" for India.—Mr. G. L. Acworth, Chairman of the United Planters' Association of Southern India, alleges that the planters are not so much to blame as the Indian Government for the non-establishment of a "Cess" on tea (for advertising purposes) such as is so successfully collected and utilised in Ceylon. If that be the case, we think it would be well if the Viceroy were approached, and if this could be done through the Ceylon Government or His Excellency Sir West Ridgeway personally, a successful issue might be anticipated. If the Planters' Association prepared a brief statement of how the Cess has been worked in Ceylon and what has been done with the money, and requested our Government to lay it before the chief Indian authorities—or the Viceroy himself—with the hope that a similar Cess (as prayed for by the Indian planters?) might be sanctioned for India, we cannot see how a refusal could be given.

Colvillea Racemosa.—This is one of the most beautiful trees we have received from Madagascar, and like the Flamboyant (*Poinciana regia*) it belongs to the great *Leguminosoe* Order. It was introduced into this country many years ago, and is almost naturalised here. It attains to a height of some forty feet; has beautiful fern-like foliage, not unlike that of *P. Regia.* When in flower, as it is now, it is a grand object with its long racemes of glowing orange-scarlet flowers, rising from the upper axils of the leaves. From two to five racemes, about fourteen inches long, come out at each terminal axil. When properly grown and a little care taken of it, the tree grows into a handsome shape. It is easy of culture, and is propagated from seed, which it bears freely. The tree is well worth a place in any garden. —*Indian Gardening and Planting*, Sept. 6.

The "Plumbago" Puzzle.—A correspondent to our contemporary puts the mystery surrounding the plumbago trade "in a nutshell," when he says:—

"Whatever the cause was for the rise beginning in 1897, and going on till nearly end or middle of 1899, the fact must remain that people wanted plumbago for specific purposes, and not to lay it down on the chance of it being useful some day. Whatever the stuff is used for, it must be—one would think—for the class of things whose manufacture or outturn is expanding and not contracting, and yet we see 242,000 cwt. selling at vastly inferior prices in 1900 to 400,000 cwt. in 1899 (export to 30th August for the two years)."

To say that the desire to lay in stocks, caused the great rush and increase in price, notwithstanding 50 per cent more of ship-(ments) during 1899, is absurd on the face of it; while increased activity in armaments seems only a partial explanation.

Rubbishy Teas in the Colombo Market.—We have repeatedly urged self-respecting tea planters—the vast body of the community in fact—to take action through their Association with reference to stuff which is a disgrace to the name of "tea" put up for sale in the local market. Again and again has such "Ceylon tea" been condemned as "unfit for human food" at the Melbourne Customs; and though London is not so strict, there can be no doubt of the injury done to our good name from such shipments. We are glad to see that Mr. F. F. Street is supporting our view of the need of a paid "expert" at the local Customs to stop the export of *trash*, such as is never seen from even China or Java. Surely factory sweepings or spoilt tea, if they have to be sold at all (in place of being put in the manure heap) can be disposed of to coolies or tambies? Here is an extract from Mr. Street's latest circular:—

"Quality.—Generally the selection has not been good, catalogues containing a large proportion of tea more or less spoilt in manufacture. Many of these rubbishy teas can only bring discredit on the industry, as the worst get into native buyers' hands, who sell them, at large profits, in our Harbour, to passengers calling here. Quotations of from 10 to 20 cents must leave loss to the estate. We desire to draw the 'Thirty Committee''s attention to this subject, as it is an evil that has existed for many years. It seems rather absurd that planters should require protection against themselves, but that such protection is needed, in the interests of the industry, is manifest to everyone connected with the trade."

Malacca Rubber At Kew.—Specimens of gutta and rubbers from Malacca have been very favorably reported upon at Kew, with prices ranging as high as 2s 10d per lb (for *getah greep jantan*). The neglected child of the Colony may yet recover some of her pristine prosperity with such favorable results.—*Perak Pioneer*, Sept. 5.

A Rich Russian Rubber Company.—The profits of the Russian-American India Rubber Company, at St. Petersburg, for the last business year are reported at 2,941,906 rubles, against 3,945,222 rubles, in the year 1898 99. The dividend will be only 35 per cent., against the customary yearly dividend on 50 per cent.—*The India Rubber World*, August 1st.

The Sustaining Power of Bananas.—One of the most courageous marches ever taken, was that of Colonel Willcocks to Kumasi. We hear that during the march from Kumasi the whole party lived on Bananas. On one occasion they even waded shoulder high through a river for two hours. Does anyone want a higher test of endurance on a vegetable diet than this?—*Journal of Horticulture*, August 16th.

Tea Prospects at Home.—There have been growls over the heavy London stocks of Ceylon tea at the end of August. But it is pointed out that, notwithstanding big arrivals, they are not heavier than at the end of July, and that August's deliveries have, therefore, been very satisfactory. It is from the present date onwards that the stocks should gradually decline, and we hope to see a considerable difference at the end of September and of October.

Timber Transport.—The Cochin Durbar have secured the services of Mr. Hatfield, an engineer, to prepare a scheme for the construction of a tramway to convey timber from the Sircar forest to the backwater, and for the deepening of canals to float the logs down expeditiously. At present it takes a little over a year for the timber to reach the Sircar Depôt at Ernacolum, after considerable difficulty and expense; but when the scheme is completed there will be a saving of money and time. The scheme is estimated to cost two lakhs of rupees.—*Pioneer*.

A New Fruit.—In this thirsty season the raiser of a new fruit is a public benefactor. "The Mahdi" is not a pleasant name, but we do not doubt Messrs. Veitch's new hybrid of the raspberry and the common blackberry is not the less sweet for it. Perhaps they will send samples to the newspapers, as the Kentish gentleman did with the tobacco he had raised, which led to lively expectations of a new industry for distressed agriculturists in Southern England and Ireland. It is not the first time this hybrid has been heard of. In fact, it has been something of a sea-serpent in its generous appearances. But this time there is no mistake about it. Its origin is known and it is duly certificated. We hope it may become as popular and as plentiful as blackberries. Too little enterprise is shown in the cultivation of new fruits in England. There is the Rocky Mountains berry (*Rubus deliciosus*), for instance, which well merits attention, and would thrive in many soils. The worst of these delicate soft fruits is they must be lightly handled and quickly despatched. And then the growers assert that railway freights are exorbitant, if not prohibitive.—*Egyptian Gazette*, Aug. 23.

A New Assam Line on the metre gauge system has been proposed. It will run along the foot of the Khasi Hills to Jherria, thence westwards to Mao-iong, Jatab Tilah and Dwara Bazar. Including sidings, the length of the line will be thirty miles, and it is estimated that the cost will be R15 lakhs. It is expected that the gross earnings will amount to R1,50,000 a year, and the working expenses are estimated at 53 per cent so that the return on the capital outlay will be 4·67 per cent.—*Pioneer*.

Criticising Tea Companies.—We give elsewhere an extract from the latest *Investors' Review* in which the Editor, Mr. Wilson, is engaged in the (to him) congenial occupation of pitching into the financial methods of the promoters of certain big Tea and Plantation Companies. There is, no doubt, another side to the picture which he presents if the Directors cared to come forward with it.

The Late Sir John Lawes.—"I am afraid," writes a correspondent, "the Tea controversy proved too great a shock for the veteran Scientist of Rothamsted. It was bad enough to be misunderstood and misrepresented by his neighbour, G. A. Talbot; but that his newspaper echo here of manurial heresies, should ask whether the great student and advocate of scientific agriculture had ever seen a tea bush, must have been too much for the octogenarian. R I.P."

The Trees of Mexico—the vegetation of the *tierra caliente* has often been described and compared with that of Ceylon, says a correspondent of the *Speaker*; but upon the great Mexican plateau also the trees, where they exist, are splendid and always contrive to group themselves well. Foremost, I think, comes the ash—a glorified ash, handsomer than ours, graceful as well as massive and of the richest green; but the characteristic tree is the pepper-tree, or, as it is commonly called, the Peru, for it is not indigenous to this country but was introduced years ago by a Viceroy from Peru. It is of a most brilliant green and covered with bunches of coral-like berries. At a distance this tree rather resembles our willow, while the willows, in protest as it were, have taken unto themselves the shape of poplars. No enumeration, however, would be complete without special mention of a species of cypress which, though of no great height, attains a gigantic size. Its bulk must be measured by the ground it covers, for its branches spread out in all directions. The Ahuete-huete, the finest specimen at Tule, has a trunk 40ft in diameter. The ubiquitous prickly pear and cactus hedges give our Mexican scenery a character essentially its own—the prickly pear has always been Mexican, it was the Aztec emblem and is still stamped upon the ponderous Mexican dollar. To complete and vary my picture, Mexican landscapes are blessed by the richest diversity of beautiful skies and the cloud effects are quite unrivalled in spite of the dry climate—or rather, perhaps, because of it: such extraordinary brilliance may be due to the dryness of the air:—

> "Largior hic campos aether, et numine vestit
> Purpureo."

The sky seems "larger" here than anywhere else. I mean that one seems to see more cloud-pictures all round, and not only towards or away from the sun. Our atmospheric brilliance, too, seems to fit the Virgilian "purple."

PRODUCTION OF TEA IN INDIA.

OFFICIAL STATISTICS.

[The two tables appended state the facts regarding the production of tea, the first in abstract for the fifteen years 1885 to 1899, the second in detail for the two years 1898 and 1899. It should be noted, however, that the figures, for which the Government are dependent upon the planting community, are imperfect and defective, planters sometimes withholding information.]

AREA.

The area under tea in India at the end of 1899 extended over 516,732 acres, nearly two-thirds (64·1 per cent) being in the valleys of the Brahmaputra and Surma, which contain as much as 331,151 acres—namely, 198,673 in Assam (the Brahmaputra valley) and 132,478 in Cachar and Sylhet (the Surma valley). In extent of cultivation Bengal comes next, the area under tea being 132,923 acres, or 25·7 per cent of the whole, and about the same as in the Surma valley.

The production of tea is therefore, to the extent of nine-tenths of the whole area, limited to the two provinces of Assam and Bengal.

The other tenth is divided between Northern and Southern India, thus :—

Northern India.	Acres.	Southern India.	Acres.
North-Western Provinces	7,854	Madras ..	10,164
Punjab ..	10,135	Travancore and Cochin ..	23,115
Total ...	17,989	Total ..	33,279

The principal localities in each province where tea is grown are these :—

In Assam.	Acres.	In the North-Western Provinces.	Acres.
Surma Valley:		Kamaun ...	2,846
Cachar ...	60,542	Dehra Dun ..	5,008
Sylhet ..	71,936		
Brahmaputra Valley:		In the Punjab.	
Sibsagar ...	76,797		
Lakhimpur ..	63,444		
Darrang ..	41,469	Kangra ..	10,135
Nowgong ...	12,520		
Kamrup ...	3,818		
In Bengal.		In Southern India.	
Darjeeling ...	50,673		
Jalpaiguri ...	74,121	Nilgiris ..	7,321
Chittagong ...	4,663	Malabar ..	2,398
Ranchi & Hazaribagh	3,366	Travancore ..	23,103

There is a small area of 1,390 acres in Upper Burma, but in this province the leaf which is produced is not made into tea, but is pickled to be eaten by the Burmans, and the area and production may therefore be left out of account,

There are also a few small areas in Goalpara, the Khasi and Jaintia, hills, the Chittagong hill tracts, Simla and Cochin.

Tea cultivation in India has been mainly concentrated in tracts where a heavy rainfall and a humid and equable climate permit of repeated flushes and pluckings of the leaf. In the valleys of the Brahmaputra and Surma the yield averages about 448 lb. to the acre, and in Bengal about 406 lb., the yield in Jalpaiguri (the Duars) being 533 lb., and in Darjeeling about 281 lb. In Travancore the average yield is stated at 644 lb. per acre, a figure that must be taken under reserve. In the North-Western Provinces the yield per acre is 297 lb. Elsewhere the yield is much lower.

The area under tea has expanded from year to year without a pause during the fifteen years comprised in the statistics appended. In 1885 the area was about 284,000 acres ; in 1899 it had increased to 516,732 acres, the increase being in the ratio of 82 per cent.

The number of acres added to the tea-growing area each year has been :—

	Acres.		Acres.
1886 ..	14,294	1893 ..	20,970
1887 ..	14,584	1894 ..	4,688
1888 ..	11,524	1895 ..	15,190
1889 ..	9,374	1896 ...	17,563
1890 ..	11,126	1897 ..	36,838
1891 ..	17,610	1898 ...	31,561
1892 ..	12,432	1899 ..	15,052

The average addition in the last five years (23,241 acres) was much larger than the average addition (13,365 acres) in the five preceding years.

The plantations vary greatly in size. In Assam, where the industry is mainly carried on by Europeans with ample capital, where fusions of estates have been in progress for some years in view to economy of management, and where most plantations have large unplanted areas attached to them, the area of a plantation averages as much as 1,266 acres. In Bengal the average area of a plantation is 727 acres ; in the North-Western Provinces the average falls to 119 acres, while in the Punjab, where natives grow tea extensively in the Kangra valley, there are only about four acres to each plantation. In Madras the average is about 86 acres.

PRODUCTION.

The quantity of tea produced has increased in the past fifteen years in much greater ratio than the area under cultivation, for, while the area has increased by 82 per cent, the increase in production has been 161 per cent. In 1899 the production in Assam, where the season was favourable in most of the districts, increased by more than 18 million pounds, and in Bengal by more than 4 million pounds.

Representing the area and production in 1885 by 100 in each case, the ratio of increase in each compared with that year is stated below, the actual increase of production each year over the production of the preceding year being also stated :—

	Area.	Quantity produced.	Actual increase annually in lb.
1885 ..	100	100	..
1886 ...	105	115	10,899,835
1887 ...	110	129	9,826,270
1888 ..	114	139	7,540,462
1889 ..	117	149	7,250,331
1890 ..	121	156	4,993,531
1891 ..	127	173	11,831,496
1892 ..	132	170	—1,873,628
1893 ..	139	185	10,253,626
1894 ..	141	188	2,465,144
1895 ..	146	200	8,694,783
1896 ..	152	219	13,018,227
1897 ..	165	215	—2,643,846
1898 ..	177	228	9,296,746
1899 ..	182	261	23,445,966

PERSONS EMPLOYED.

The number of persons employed in the tea industry in 1899 is returned at 558,001 (permanently) and 96,615 (temporarily), or altogether about two-thirds of a million people (654,616 persons), which would work out to about 1·27 persons to the acre.

EXPORTS AND CONSUMPTION.

The tea produced in India is exported, mainly to the United Kingdom, to the extent of about 97 per cent of the average production, The sub-

joined figures give approximately the quantity of tea consumed in India, the figures representing the average of the last five years:—

		lb.
Indian tea	Produced ..	160,643,992
	Exported ..	155,474,416
	Left in India ..	*5,169,576*
Foreign tea	Imported ..	6,210,615
	Re-exported ..	3,487,630
	Left in India ..	*2,722,985*

Thus approximately 8 million pounds were left in India on the average of which 5·17 millions Indian and 2·72 millions foreign, the bulk of the foreign tea being Chinese, though a substantial quantity consists of Ceylon tea. More than a million pounds are purchased annually for the British Army, and a larger quantity must be consumed by the European and Eurasian civil population, and by natives who, in some of the larger towns, are adopting the tea drinking habit.

The principal markets for Indian tea are stated hereunder, with the quantity exported (in lb) to each country in the last five years:—

By Sea:—

1895-96.	1896-97.	1897-98.	1898-99.	1899-1900.
United Kingdom.				
123,947,369	135,456,884	137,655,857	139,245,995	154,161,492
Australia.				
6,774,652	6,155,895	6,792,654	6,306,135	8,362,797
United States and Canada.				
989,065	1,607,731	1,523,236	2,457,880	4,677,797
Persia.				
3,188,099	1,993,823	1,464,394	3,456,791	1,953 900
Russia.				
486,255	457,634	689,271	500,889	467,451
Trans-frontier:				
Kabul, Kashmir, and other countries on the North-Western Frontier.				
1,195,264	1,499,120	868,560	1,042,160	2,100,560
Other trans-frontier countries.				
6,048	13,664	18,144	23,968	25,312

PRICES

The prices of tea in Calcutta fluctuate greatly. Taking the price in March 1873 to be represented by 100, it appears that until 1885 the level was well above that point, varying from 110 to 148. In that year, coincidently with the great fall in exchange and in general prices, the level fell to 90, and a low level was maintained in the following years until 1895 when there was a rise again to a high level. In 1897 prices again fell and they have remained at a low level since, as the consequence of the extremely rapid increase of production in India and Ceylon.

These figures all represent the course of prices of fine Pekoe in January of each year as given by the Bengal Chamber of Commerce. The level for each year from 1873 is stated below:

1873	..	100	1887	..	77
1874	..	123	1888	..	84
1875	..	123	1889	..	77
1876	..	136	1890	..	63
1877	..	148	1891	..	81
1878	..	135	1892	..	71
1879	..	129	1893	..	87
1880	..	126	1894	..	52
1881	..	135	1895	..	97
1882	..	126	1896	...	84
1883	..	110	1897	...	64
1884	..	116	1898	..	61
1885	..	90	1899	..	58
1885	..	90	1900	...	64

In the Statistical Department the average prices of the various descriptions of tea sold at the public sales held in Calcutta during the tea season have been computed for some years past. From these accounts the figures below are taken, being the prices in annas and pies per pound of the three descriptions which form the largest proportion of the tea sold and the variations in the prices, the average price of 1888 being represented by 100:

	Broken Pekoe.			Pekoe.			Pekoe Souchong.		
	Price		Variation	Price		Variation	Price		Variation
	As.	Pie.		As.	Pie.		As.	Pie.	
1888	10	5	100	8	1	100	6	3	100
1889	9	9	95	7	5	92	5	7	89
1890	8	$10\frac{3}{4}$	87	7	2	89	5	$8\frac{1}{4}$	91
1891	8	$7\frac{1}{2}$	85	7	$0\frac{1}{2}$	87	5	$3\frac{1}{3}$	84
1892	11	$3\frac{1}{3}$	110	8	9	108	6	$5\frac{1}{4}$	103
1893	9	2 4-5	90	7	$2\frac{2}{5}$	90	5	4 4-5	87
1894	11	8	114	9	4 4-5	116	7	2 5-7	116
1895	9	—	88	7	3 4 7	91	5	11	95
1896	8	$7\frac{3}{4}$	85	6	9 9-10	85	5	$5\frac{1}{2}$	88
1897	7	5 5-7	73	6	$0\frac{3}{4}$	75	4	$10\frac{2}{3}$	79
1898	7	—	68	5	8	70	4	7	73
1899	6	$9\frac{3}{4}$	66	5	$8\frac{3}{4}$	71	5	$0\frac{2}{3}$	81

J. E. O'Conor,

Aug. 14, 1900. Director-General of Statistics.

CEYLON TREES:

SECTIONS WANTED.

We are glad to learn from Mr. Herbert Wright (Scientific Assistant at Peradeniya) that he does not want Calamander or Ebony in particular, and that it does not matter whether the trees are native or otherwise. Mr. Wright wants sections of *any* tree, of *known age*, providing it has been subject, throughout its life, to a Ceylon climate. For instance, a section of stem of Cacao, Erythrina, Bombax, Grevillea, etc., would,—providing the age was known,—afford data on which to base general conclusions. The greater the variety of specimens forwarded, the better it will be. This being the case, we feel sure that not a few planters and others will endeavour to oblige Mr. Wright. Sections of Grevillea from Upper (or Lower) Dimbula, to compare with sections of the same tree grown at 2,000, 3,000 and even 4,000 feet lower down, could not fail to be of interest. Of course, Hakgalla Gardens, New Galway, Nuwara Eliya and Uva, as well as the Western districts, can give a variety of tree sections, of Grevilleas, Eucalypti, and Acacias; while any planter uprooting or cutting down an old cacao tree should not forget Mr. Wright.

West Indian Lime Juice.—Mr Algernon E Aspinall, secretary of the West India Committee, Billiter Square Buildings, writes to the *Times*:—"The attention of the West India Committee has been called to the fact that at the present time lemon juice is being largely mixed with lime juice in this country, and the compound is being sold as 'lime juice,' to the detriment of the buyer and of those British West Indian colonies, such as Montserrat and Dominica, where the lime fruit is extensively grown. The West India Committee, therefore, confidently appeals to the British public to further the interests of those colonies by insisting upon 'pure West Indian lime juice' and 'cordials' being sold in bottles marked as such or so described in the invoices. By this precaution every buyer will secure for himself the benefit of the Merchandise Marks Act (1887), which forbids any false trade description, and thus secures the buyers in obtaining the goods they have asked for."—*British and Colonial Druggist*, Aug. 24,

TEA PLANTING AND EXTENSIONS IN NORTHERN INDIA.

Some weeks back a Ceylon Visiting Agent expressed the opinion that only the visit of a practical man to the Assam and other Tea Districts in the North could give us reliable information as to the actual condition and prospects of the Tea Industry as a whole. We supplemented this opinion by expressing surprise that some of the planting journals in Calcutta or elsewhere did not take the trouble to get exact and full information. On this, our contemporary of the "Indian Planters' Gazette" thinks we have not been reading his columns, inasmuch as they have contained full reports of the working of the principal Indian Tea Companies and reviews of the Government Blue Books. But we have to tell our contemporary that, all these we have read and yet we are not satisfied. We get all the Official Reports direct and treat them only as affording approximate information, just as the reports of the "*principal*" Tea Companies can only amount to "approximate" and not complete information. Is there not room for an enterprising young journalist in Calcutta to do what we did in Ceylon when we laid the foundation of exact planting statistics, namely to visit each of the tea districts in person and compile information on the spot which could then be maintained by means of circulars at intervals. In a few months, we hope to be able to tell the world not only the exact acreage planted with tea in Ceylon; but the area planted under 6, 4 and 2 years old—the extent of fields (if any) just cleared and the prospect as to any farther extensions. It is no doubt a big order to ask all this for India with its 480,000 or more acres of tea; but then Ceylon counts up to not far short of 400,000 acres. We are aware that Messrs. Thacker, Spink & Co.'s Directory gives the cultivated acreage of each estate; but there is nothing to shew how much is young tea or newly planted and still less what extensions are in prospect. The Tea Association in its annual estimate deals with young and old tea; but there is surely room for a Calcutta journalist or a planting correspondent to run round the districts and compile a very valuable statement, meantime writing letters by the way which, we think, would give our contemporary of the *Indian Planters' Gazette* great prestige and advantage if they appeared in his columns.

IMPORTS OF MANURES INTO CEYLON.

We have been asked to obtain for planting information the figures showing the importation of Manures for 1899 (the whole year) and for the first six months each of 1899 and of 1900; and while we give the former from the Annual Report, for the latter we are indebted to the courtesy of the Principal Collector of Customs. It will be seen that the past half-year shows no increase as regards saltpetre refuse or sulphate of potash, but sulphate of ammonia shows a rise of 109 tons. In bone dust there is a comparative decrease; but it is difficult to compare other items seeing that this year so much is put under the heading of "other manures." Taking the totals of value, the comparison for the six month periods is as follows:—January June 1899:—R526,703; January-June 1900:—R701,516—showing a big rise.

1899.

Imports:	Quantity.				Value.	
	Tons	cwt.	qr.	lb.	R	c.
Manure, Bone ...	3,635	19	0	0 ...	235,223	7
Patent Manure ...	—			..	—	
Rape Cake Manure	100	0	0	0 ..	4,498	0
Refuse of Saltpetre	304	13	1	19 ...	68,480	27
Castor Seed Poonac	6,476	15	0	0 ..	378,269	51
Fish Manure ..	48	5	1	0 ..	3,174	0
Manure, Chemical	3,054	16	1	3 ..	305,566	94
Manure of Potash	343	0	2	0 ...	41,872	27
Sulphate of Ammonia	145	9	3	24 ...	30,968	15
Linseed Manure ...	45	18	0	0 ...	1,339	50
Guano ...	—			...	—	
Sulphate of Potash	124	5	0	0 ...	22,910	14
Sulphate of Iron ...	3	15	0	0 ...	240	0
Total ..	14,282	17	1	18 ...	1,092,533	85

(According to the classification in force from 1st September, 1892.)

	January to June, 1899.				Value.	
	Tons	cwt.	qr.	lb.	R	c.
Manure, Bone ..	2,648	17	0	0 ...	127,549	84
Manure, Chemical	1,188	6	2	10 ...	136,282	6
Sulphate of Ammonia	64	18	3	13 ..	12,028	91
Sulphate of Potash	249	0	1	10		
	and 18 barrels ...				47,354	79
Refuse of Saltpetre	cwt. 2,603		0	13 ...	30,111	65
Castor Seed Poonac	tons 2,905½			..	173,460	17
Fish Manure	cwt.	14	0	0 ...	16	0

(According to new classification in force from January, 1900.)

First half year of 1900.

Raw Materials	Tons	cwt.	qr.	lb.	R	c.
Chemical Manure.						
Refuse of Saltpetre	376	4	1	22 ...	82,034	3
Sulphate of Ammonia	173	13	0	24 ..	33,039	7
Sulphate of Potash	cwt. 3,600		0	0 ...	30,629	58
Muriate of Potash	tons 10	0	0	0 ...	1,656	25
Basic Slag ..	696	0	0	0 ...	32,892	82
Miscellaneous Manure.						
Bone ...cwt.	49,152		2	19 ...	120,937	96
Fish ...cwt.	96		0	0 ..	222	0
Others (not Chemical) ...cwt.	8,835		0	16 ...	32,747	84
Manufactured Articles						
Other Manure.						
Bone Meal ...tons	18	15	2	0 ..	3,194	12
Other ...cwt.	136,341		1	0 ..	334;272	31

A NEW GUTTAPERCHA.

INTERESTING DISCOVERY AT ZANZIBAR.

An interesting discovery has recently been made in Zanzibar. According to our consul there, the fruit of a tree which grows principally at Dunga will, on being tapped with a knife, produce a white fluid which when placed in boiling water, co-agulates into a substance closely resembling gutta-percha; this in the process of cooling becomes hard, but can on its previous soft state be moulded into any required shape. The fruit somewhat resembles a peach in shape, but is of the size of a small melon. It is not improbable, he adds, that it will prove to be an inferior order of Guttapercha.—*Globe*, Aug. 31.

THE INDIAN TEA CROP 1900-1:

TO TOTAL 182 MILLION LB.

The Secretary, Indian Tea Association, under date, 8th September, has issued the following particulars with respect to the present season's crop of Indian tea, *viz.* :—

	Manufactured to 15th Aug. 1900.	Balance to be made to end of season 1900.	Total.
	lb.	lb.	lb.
Assam ...	31,194,240	35,156,456	66,350,696
Cachar ...	13,025,338	14,343,489	27,368,827
Sylhet ...	14,607,380	18,473,260	33,080,640
Darjeeling ...	4,758,269	3,084,690	7,842,959
Terai ...	1,392,028	1,150,720	2,542,748
Dooars ...	10,491,623	12,448,690	22,940,313
Chota Nagpore ...	76,960	80,000	156,960
Chittagong ...	391,041	483,345	874,386
Kangra Valley ...	1,600,000	1,300,000	2,900,000
Dehra Dun ...	886,845	732,500	1,619,345
To this total of must be added:—			165,676,874
1. Kumaon (Estimate)			300,000
2. Gardens from which no returns have been received, including private and native gardens (Estimate)			16,168,000
Total			182,144,874

Shipments to America, the Colonies, and other Ports are estimated at 23,000,000 lb., and local and trans-frontier consumption at 7,250,000 lb. There will, therefore, remain on this basis about 151,894,874 lb. for export to Great Britain. As the statistics from Travancore and other districts in Southern India have not been received to date they will be issued separately.

As a means of comparing with the above, we give the Indian tea exports for the past three seasons:—

	Twelve months, 1st April to 31st March.		
	1897-98.	1898-99.	1899-1900.
	lb.	lb.	lb.
To United Kingdom ...	137,655,857	139,245,995	154,161,492
To Russia ...	689,271	500,889	467,451
,, Canada ..	593,532	1,044,256	1,932,943
,, United States ...	929,704	1,413,624	2,744,854
,, China ...	565,274	883,307	1,248,857
,, Persia ...	1,464,394	3,456,791	1,953,900
,, Turkey in Asia ...	1,336,970	2,598,281	2,149,414
,, Australia	6,792,654	6,306,135	8,362,797
,, Other Countries ...	1,424,161	2,021,394	2,016,419
Total ...	151,451,817	157,470,672	175,038,127

We believe our own Planters' Association Committee will very shortly issue a revised estimate for the Ceylon crop or export for 1900; but there is no chance, we fear, of its being lower than the original estimate of 138,000,000 lb. Already we have about reached the 100 millions, and we suppose we are bound to exceed 140 by the end of the year. The practical question then is how is the aggregate of the Indian and Ceylon Tea exports—or 325,000,000 lb. at the very least, allowing for South India—to be disposed of? Much depends on Russia and America and on the course of affairs in China.

BEET SUGAR CROPS OF THE WORLD.

Writing on the 16th June, Mr. F. O. Licht reports uneven weather in Germany, warmth alternating with fosts and snows, followed by copious rains. Work of hoeing has been somewhat delayed, and is slightly behind, but the beets have sprouted well, and now look strong and healthy. It is estimated the beet area of Europe will inerease this year by 209,000 heetares.

"Our preliminary estimate of the European beet sugar production, will compared with the preceeding campaigns as follows:—

	1899-00.	1897-99.	1807-98.	1896-97.
Germany	1,790,000	1.721.718	1,852,857	1,836,536
Australia	1,120,000	1,051,290	831,667	934,007
France	970,000	830,132	821,235	752,081
Russia	900,000	776,066	738,715	728,667
Belgium	300,000	244,017	265,397	288.009
Holland	180,000	149,763	125,658	174,206
Other countries	275,000	209,115	196,245	202,990
Total	5,535,000	4,982,101	4.831,774	4,916,586

"Thus the campaign of 1899/00 is giving hopes of a surplus of about 553,000 tons against its predeeessor."—*Sugar Journal and Tropical Cultivator.* Aug. 15.

INDIAN TEA ASSOCIATION.

INTERESTING TEA ITEMS.

The following is an abstract of the proceedings of a meeting of the General Committee held on the 4th instant.

Present:—Mr. H C Begg (Chairman); and Messrs. R H A Gresson, W Holder, G Kingsley, A Trocher, and T Traill,

Letters of 27th July and 3rd and 9th August from Mr. Ernest Tye, Secretary, Indian Tea Association, London, came up for final consideration after previous circulation. The chief matters dealt with in these letters were:—

(*a*) BONDED WAREHOUSE CHARGES.—In the letter of 29th July it was stated that the London Committee had informed the Secretary of the Tea Clearing House Committee that the concessions made were not wholly satisfactory. Particular objection had been taken to the withdrawal of the reduction in the bulking and taring charge which bad been made on the 23rd January.

(*b*) PARIS EXHIBITION.—In his letter of 3rd August Mr. Tye stated that the Indian tea stall was well patronised for the tea in packets; and that orders were daily received from all parts of France for quantities varying from 1 lb. to 5 kilos. The majority of these orders were from former visitors to the Exhibition who had left Paris. The Association Contractor, Mr. Langdale, considered the result of the efforts which had been made was most encouraging; and he thought that further progress would best be attained by the establishment of sale depots. He hoped to have two hundred of these in working order in different parts of Paris before the close of the Exhibition in November.

(*c*) THE PROPOSED BOUNTY ON GREEN TEAS.—This matter was referred to in the letter of 3rd August, from which it appeared that further samples of green teas suitable for America would be shortly sent out from London. These samples would be in addition to those to be received from Chicago.

The Committee had in the meantime received samples of the green teas which some of the gardens in the Association were prepared to manufacture in consideration of the bounty. It was decided to submit these samples at once to the experts, and to ask for their opinion upon them. As the standard samples had not arrived, the experts were to be instructed that while they might definitely accept any samples which they might deem suitable, none were to be definitely rejected at present. An offer made by a

member of the Committee to place before the experts certain standard samples which had been received from America, was accepted with thanks. The Committee had also previously taken steps in the direction of procuring samples of Ceylon green teas.

(d) Tea in South Africa.—In his letter, dated 9th August, Mr. Tye stated that the Committee in London were inclined at present to leave the sale of Indian tea in South Africa to the ordinary course of trade.—*Indian Gardening and Planting*, Sept. 6.

FOR AGRICULTURE AND SETTLEMENT.

AUSTRALIA V. SOUTH AFRICA.

Now that there is a prospect of a termination of the war in South Africa, and that it appears clearly to be the intention of the British Government to place the Orange Free State and the Transvaal under British rule, the Australian nomadic instinct has begun once more to assert itself. From Victoria and New South Wales there appears to be a large exodus of adventurous spirits to the new colonies (for the Orange Free State has already been formally annexed by Great Britain under the name of the Orange River Colony), where they hope to better their condition either as mechanics, farmers, miners, or labourers. As it was in the early alluvial mining days in the various colonies of Australasia, when, if a report were spread that a new rich alluvial goldfield had been discovered, immediately hundreds of men abandoned claims, where they were doing moderately well, and rushed away on horseback, on foot in drays, and even pushing wheelbarrows to the new Eldorado, not pausing to consider distance climate, supply of provisions, &c., so it seems that today the Australian worker is inflamed with a desire to seek better fortune in our new colonies.

Before the mania for emigration to South Africa takes hold on the Queensland miner, farmer and others, we should like them to pause and give heed to what is said by those who have been in that country for many years

Let us consider the Orange River Colony, the area of which is 50,000 square miles. Like the adjoining parts of the central plateau, it is, says Mr. A H Keane in the lastest work on the Boer States, essentially a steppe (plain) land, level or undulating, covered for the most part with herbage, somewhat dry and in places even bare. Hence it is mainly a vast grazing ground, affording pasture to millions of merino and Cape sheep, goats, cattle, and horses, but so *ill-adapted for tillage* that scarcely one-hundredth part of the whole area is under cultivation. The rich agricultural tracts are mainly confined to the banks of the Caledon River, where the land under wheat is increasing, and where the vine and fruit trees also thrive.

But elsewhere, and especially towards the south-western frontier, the country presents an extremely dreary and even desolate aspect, and this character is maintained on both sides of the Orange River below the Caledon confluence. Thus, the extensive tract stretching from Kimberley for 150 miles across the river towards the De Aar railway junction *may* possibly contain vast underground treasures, but on the surface has little to show except a monotonous succession of rugged, waterless, and almost treeless plains, dotted with boulders, and here and there relieved by the so-called kopjes, weather-worn knolls or hills, seldom rising more than 600 or 700 feet above the surrounding land.

These kopjes are admirably adapted for defence, and, when manned, form a series of small citadels, and so were eminently suited to the peculiar style of warfare of the Boers. All the waters of the Orange River Colony flow into the Orange River, and are so carried to the Atlantic. But the tributaries of that river are something like many of our Queensland rivers inland. They look well on a map, but the thirsty traveller often finds them mere beds of sand.

Now a word about the Transvaal. This republic has an estimated area of 119,000 suquare miles. A high range of mountains from 5,000 to 6,000 feet high runs along its eastern boundary, and there are numerous central and south-western "rands" or hills, which, except in the cases of isolated peaks do not rise more than a few hundred feet above the tableland. This tableland, consisting of rolling downs, represents almost the whole of the Transvaal. The Limpopo or Crocodile River forms the northern boundary, and here the land falls to about from 2,000 to 2,500 feet above sea-level. This portion of the country, the Limpopo Valley, is extremely unhealthy, fevers of the African type being very prevalent. The country bordering the river is well-wooded, and affords splendid cover for the big game which has as yet escaped the bullets of the Boer and European hunters. The dreaded tzetze fly is also much in evidence here. Amongst the wild beasts may be mentioned the lion, leopard, hippopotamus, rhinoceros, and crocodiles. Along the whole course of the Limpopo there is a stretch of country 40 miles wide, rendered uninhabitable to settlers, owing to the ravages of the tzetze fly amongst horse and other stock.

The great want of the two countries is water and rain, and the Western squatters of Queensland know too well by bitter experience what this means. It means that cultivation is impossible, and it means that watered and grass country must be available to which the starved-out flocks and herds of waterless regions can be driven to find sustenance. Without irrigation, agriculture must continue to hold a very subordinate place in the industries of both the Orange River and Transvaal colonies. Of minerals, there are vast deposits in the Transvaal; amongst them, gold ranks first. Next come copper, iron, lead, saltpetre, sulphur, coal, and diamonds. Only 5,000 or 6,000 acres of gold concessions have as yet been worked, so it would seem there is room for the prospector. Silver, copper, and lead have not been worked for the past six years.

Now touching the climate. Owing to the position of the great mountain ranges, the rains occur much as they do in our own colony. The country east of the range gets the greatest rainfall, and this becomes a more and more vanishing quantity as one travels towards the west. The soil is naturally fertile on the plateau south of the Zambesi, but is mostly parched in dry seasons. Tree growth is confined to willows, wild figs, and ironwood, which grow in the neighbourhood of "spruits" or river valleys and "kloofs" or deep gorges.

Where cultivation can be carried on, good crops of cereals are raised, and tobacco, the vine, and European fruits succeed well. There are as yet only 50,000 acres of this immense territory under cultivation. Can the Queensland farmer find it profitable to enter on farming pursuits there? From what we have written about the climate, the rainfall, the sandy river-beds, wild beasts, the tzetze fly, to which must be added locusts and horse-sickness, the reply would obviously appear to be, "Certainly not."

For the sake of comparison, let us draw a picture of the first establishment of a farm in Queensland.

In the first place, the farmer has a choice of land from an area of over 600,000 square miles. He can elect to live in a tropical, semi-tropical, temperate, or cold part of this enormous territory. Nearly the whole of the coast lands are well wooded; whilst inland, in addition to vast rolling plains of exceptional richness, there are forests of magnificent timber to which the settler can help himself for the purpose of building, fencing, &c. From the coast to many miles inland he is certain of sufficient rainfall for his crops. The climate is very salubrious, fevers being rarely contracted in the bush, and they are rapidly disappearing before the axes and fires of the settlers. For 300 or 400 miles inland from coast there is a plentiful supply of water, either in rivers, creeks, or lagoons. Everywhere, crops are produced all the year round: everywhere, almost, there is either a market close at hand or a railway line to take the farmers' produce to it. These railways extend in

all directions--north, west, and south—from the various coastal cities. The settler, having selected his land, can camp on it with his family in a tent in perfect safety. There are no wild beasts for him to fear. If his fire goes out at night, no prowling lion or hungry leopard springs upon him in the dark; no band of savages takes advantage of his defenceless condition to murder and plunder him. He can safely set to work, build his house of the bush timber, fence his land with the material at his hand, and set to work with the almost certainty of taking off his first crop within six months. No elephants or monkeys are here to trample down and carry off his corn or sugar-cane, or dig up his sweet potatoes for him. Here, he has perfect peace, a life of labour, but also a life full of comfort and enjoyment. He has no hordes of natives to do his work for him, and so does not yield himself up to a life of voluptuous idleness, a result which invariably happens in countries with a vast native population, as in parts of Asia, Africa, the Indies, and South Sea Islands. Here the farmer is able to work with his family and his farm hands, and it is only in the sugar districts that a certain amount of reliable black labour is necessary, although such labour is anything but what is called cheap labour.

Then take the question of roads and markets. The Queensland farmers are in almost every district in touch with a railway line. There are many large coastal cities, many large inland cities and towns in Queensland alone, where a good market exists for all the produce they can supply. In addition to these, they have the southern markets which can take large quantities of produce. How does the case stand in South Africa? There are few railways, few roads and few markets. The distances between these market towns are enormous, unless in the older settlements in Cape Colony; and old settlers in Queensland will remember how, in the old days, the only means of carrying wool and other produce to the few towns on the coast were the lumbering bullock-dray or horse-wagon. Weeks and even months were spent in such travelling. Now, a glance at the map of the two South African colonies will show what long distances would have to be travelled by farmers settling, say, in the western portion of the Transvaal or in the central and north-eastern districts of the Orange River Colony. Still greater difficulties of transit must be encountered by settlers in Bechuanaland or in Rhodesia, where there are scarcely any market towns except Buluwayo and Salisbury in the latter, and Mafeking and Taungs in the former. Such being the outlook for transport and markets, how can the Australian farmer hope to better himself by pioneering in such a country even with land at from 1s to 4s per acre?

With minerals the same objections arise: want of water and want of railways. Why go to South Africa to prospect, when such magnificent fields as the Etheridge and many other auriferous districts of Queensland in the midst of white settlement, with good roads, timber, and good land together with a fair rainfall, lie open to the prospector, and are capable of supporting large mining populations, and affording many openings for remunerative subsidiary industries?

No, we should recommend our Queensland farmers and miners, mechanics and labourers, to remember that it is "distance that lends enchantment to the view," and to also remember that not one of our colonies offers such excellent prospects to agricultural and mining settlers as does this splendid colony of Queensland with its excellent climate its just laws, its British institutions, its freedom, for all, its illimitable agricultural lands, its forests, rivers and mines, its roads, railways, telegraphs, and its numerous cities and towns. Most of these advantages are yet in the womb of tho future in the two South African colonies, and an immense amount of pioneering work will havo to be done by the Australian who elects to abandon his comfortable home for the unsettled portions of the new colonies.—*Queensland Agricultural Journal.* Aug 1.

A GIANT ELEPHANT'S TUSK.

A gigantic elephant's tusk comes from the interior of German East Africa. A native was the fortunate hunter who bagged this trophy, and it is said that the fellow tusk was only a trifle smaller. The big tusk weighs 241 pounds. The two tusks were brought by way of Bagamoyo to Zanzibar, where an American acquired them at a fancy price. Some idea can be formed of the gigantic size of the elephant, when we reflect that it carried about with it an appendage of well-nigh five cwt in tusks! Sad to relate, elephants of this size are becoming rarer every day. The merciless war of extermination carried on for years against the elephant by ivory hunters has been only too successful. Where once immense herds were to be seen, you may now travel for hundreds of miles in the vain search for those forest monsters. They tend to retire further and further from the coast in quest of solitudes as yet uninvaded by man. Perhaps the recent regulations made at the Foreign Office Conference in London may help to improve matters.—*Home paper*, Aug. 24.

ARRIVAL IN CEYLON OF A KEW BOTANIST:

FOR EXPERIMENTAL GARDENS, MALAYA.

Amongst the passengers who arrived here recently by the steamer "Hakata Maru," was Mr. Stanley Arden, a recent Kew student, who has been appointed Superintendent of Government Experimental Plantations in the Malay Federated States. Mr. Arden, in accordance with official instructions, broke his journey here for the purpose of visiting the Botanic Gardens and obtaining a general knowledge of Ceylon products and the conditions under which they are cultivated.

At Peradeniya he was met by Mr. Macmillan, a brother Kewite, and while there, he made arrangements for visiting certain estates and government rubber plantations. Mr. Arden, being educated at Stockport Technical College, has had the usual training and a successful career at Kew. In 1896 he was the winner of the Hertfordshire County Council's Scholarship. Mr. Arden left Kew in April last and has been qualifying himself in special directions for his new work. As experiments in rubber cultivation are intended to take up his chief attention at first, he went to Cambridge to study, under Professor Marshall Ward, with his assistants, Messrs. Biffen and Parkin, the most approved scientific methods of treating rubber latices for coagulation, and to acquaint himself with the principles of Biffen's patent coagulating machine.

Mr. Arden is much struck with what he has seen of the vegetation of the tropics, more especially with the wealth and beauty of the Peradeniya Gardens, the extensive undulating green lawns of which he considers are particularly grand. Most of the trees and shrubs, however, are familiar to him through his acquaintance with them at Kew, but here many of them appear in an incredibly altered form. We wish Mr. Arden a successful career in his new sphere of work. and will watch with interest the results of his experiments, and hope to include the same from time to time in our *Tropical Agriculturist.*

THE CEYLON PLUMBAGO INDUSTRY.

We have read with interest the various letters which have recently appeared in the columns of the local papers regarding the position of our one commercial mineral of importance, plumbago. At first a gradual but latterly a sudden and enormous rise in values, has been followed by a no less sudden collapse; and it is no doubt the duty of all interested in the industry to consider very carefully the present state of so important an article of export from this Colony. With this object in view, let us see what figures there are to help us. A reference to the export returns gives the following plumbago as exported, in tons, to different countries:—

In.		To U.K.	America.	Continent.	Elsewhere.	Total.
1893	..	5,059	8,192	3,469	160	16,880
1894	..	7,518	5,104	4,257	97	16,976
1895	..	6,113	7,489	3,074	70	16,746
1896	..	5,767	7,813	3,295	149	17,024
1897	..	7,983	4,440	5,333	106	17,862
1898	..	8,025	9,385	6,164	79	23,653
1899	..	9,296	15,027	6,378	118	30,819

The Ceylon Chamber of Commerce values are given as follows per ton:—

Date.		Highest price for large Lump.	Highest price for O. Lump.	Highest price for Chips.	Highest price for Dust.
		R.	R.	R.	R.
7th Jan. 1895	..	300	280	170	95
15th do. 1896	..	330	290	140	90
5th do. 1897	...	310	260	120	90
11th do. 1898	..	365	345	220	145
5th July 1898	...	600	560	370	200
10th Jan. 1899	...	700	650	500	300
4th July 1899	..	1,000	950	650	500
9th Jan. 1900	..	1,000	1,050	800	550
3rd Sept. 1900	...	700	600	450	300

From these figures it will be noticed that, until early in 1898, no movement of great importance took place either as regards increase in exports or rise in prices. There can be little doubt now that the plumbago required by crucible-makers and others, had been bought so sparingly towards the close of 1897, that when a special demand set in at that time for the article, there was practically none found on the spot unsold, either in London, New York or the Continent Consequently, orders came out to Ceylon from buyers in Europe and America, who hitherto had generally got all their supplies from the older and larger importers there, and the latter apparently having nothing to spare had to decline business. This led to a much larger and much more widely distributed demand in Colombo, and with keen competition to fulfil orders on hand, prices advanced rapidly.

The advance in prices in Ceylon was stimulated not only (1) by keen competition to get plumbago to fulfil legitimate orders; but (2) the excitement which follows an unusually large demand, combined with rapid advance in prices, led to numerous purchases being made with the sole object of such being turned over locally at a profit. Then again (3) dealers who had made forward contracts with the older and more regular exporters, found the market had gone dead against their being able to fulfil such contracts without serious loss and this led to orders at higher rates being given by exporters to enable them, if possible, to fulfil their engagements in Europe and America. The local Law Courts have given us some confirmation of this state of things. The high prices, however, led to an inevitably large output, and the exports for 1899 reached 30,819 tons against 17,862 tons in 1877. With such a great increase in export, prices could not be kept up and it only required a few large buyers to suddenly hold off the market, in order to lead to the inevitable collapse.

What is of most importance now, however, is, not what has taken place in the past, but what is to be the future of plumbago; and our reason for glancing over the past is solely that this may enable us to bring some light to bear on the future. The exports for the year 1900 (1st January to 10th September) aggregate 12,573 tons, and we would ask our readers to carefully compare these figures with the corresponding periods of 1897-1899. These are:—

1897	..	12,160 tons.
1898	..	16,988 ,,
1899	..	21,944 ,,
1900	..	12,573 ,,

—showing that for the year 1900 there has been a falling-off of 9,374 tons compared with the year 1899, and a falling-off of 4,415 tons compared with the year 1898. In short our exports have already gone back to those of the year 1897—before the great rise in prices commenced. The demand for crucibles must, of course, continue, and crucible-makers must continue to buy plumbago, and therefore it may be safely affirmed that prices of plumbago are not going back to those ruling in 1895-97. But plumbago, even at present prices, must show good returns to most of the pit-owners. Surely, if during the year 1897, plumbago could be purchased in quantity and sold at from R280 to R365 for high-grade lumps,—high-grade lumps at R600 to R700 in the year 1900 should show a handsome profit for the pit; while all other qualities are in proportion. It is easy to get people who will say that labour has gone up, and so it has; also that "this," "that" and "the other" have gone up in price, and that it will not pay owners now to work most of their mines. It will require some very clear statistical statements to be put before us, before we can accept that view, or be convinced that pitowners of local experience will not continue tofind plumbago mining a very profitable invest- ment, if values remain at or near those now current.

Of course there are pits and *pits*, and no doubt the recent boom led to wild speculation in plumbago land and to the rapid opening up of some mines which will probably never pay. Then again it has yet to be made clear to those interested, what the cost is of opening up and keeping free from water mines in the very low country, compared with the cost of such as are to be found on the hillsides in the Kurunegala and other higher plumbago districts. On one property in Maskeliya 150 tons of

plumbago have been taken out in the present year without interfering with the tea. Mining under European supervision has been going on for a few years back, and there are now mining experts available at our doors for advice. The output of plumbago will, no doubt, continue to be ample for current requirements, and if average prices remain even near those now reported as current, the industry, in our opinion, must continue to be a flourishing one, at any rate, for experienced pit-owners.

In this connection, we take over elsewhere from our contemporary, the letter of a Philpot Lane Firm who are, apparently, anxious to establish a London mart for plumbago on a new system as detailed. Even if there were no objection, and only decided advantages in this plan, we consider the day is past for such a proposal. "All the world" interested in plumbago may now be said to have come to, or to be represented, in Colombo and the fully-established direct trade with America and the Continent of Europe cannot be interfered with. The true mart, therefore, for Plumbago, with abundance of competition. is in Colombo itself.

GREEN TEAS IN CEYLON.

Extracts from Minutes of proceedings of a meeting held at the Victoria Commemoration Buildings, Kandy, on Saturday, the 15th day of September, 1900.

Ceylon Green Teas.—Submitted correspondence from various applicants for grants.

Intimated that payments had been made as under :—

July 1900	9,168 lb	Brunswick Green Teas	R916·80
do	25,000 lb	Ceylon Green Teas per Whittall & Co.	2,500·00
Aug. 1900	3,518 lb	Nahakettia Green Teas	351·80
do	1,2020 lb	Ceylon Green Teas per Whittall & Co.	1,202·00
do	10,090 lb	Brunswick Green Teas	1,009·00
do	6,990 lb	Tillyrie Green Teas	696·00
do	10,225 lb	Ceylon Green Teas per Whittall & Co.	1,022·50
do	2,367 lb	Nahakettia Green Teas	236 70
Sept. 1900	3,645 lb	Dewalakande do	364·50
do	10,120 lb	Brunswick Green Teas	1,012·00
Add total as per previous statement	181,144		18,114·40
	274,257 lb.		R27,425·70

Leaving the balance of R2,574·30 still available at date.

Read Minutes of Proceedings of a meeting of the Sub-Committee of the "Thirty Committee" appointed to confer with the Colombo Experts, with a view to establishing a Standard for Ceylon Green Teas held at Colombo, on Monday, the 13th August, at half-past seven o'clock in the morning also Minutes of Proceedings of a meeting held at Colombo on Tuesday, the 28th August at 3 p.m. to fix upon a Standard for Ceylon Green Teas. Resolved :—"That the Report be adopted as follows.

(1) That in Green Teas each grade must be restricted to 5 per cent siftings when sifted through a sieve of No. 30 Mesh. (2) That the grades be

Young Hyson (Broken Pekoe and Orange Pekoe)	Hyson (Pekoe)	Hyson No. 2 (Pekoe Souchong and Souchong)

(3) That up to 10 per cent of leafy siftings as a separate grade be allowed for cess in each invoice not more than half of which shall pass through a No. 30 sieve. (4) That the sample of Hyson No. 2 submitted be approved as a Standard. Subject to (a) the tea having the absolutely true green character and containing no fermented leaf (b) cloudy or brown liquor must not be passed. (5) That the question be again brought up for consideration two months hence. (6) That before payment of the grant under the new scheme there shall be filed with the Secretary an invoice (form to be supplied on application). (7) That the sanction of the Governor in Executive Council be applied for to an appropriation of of R20,000 as desired and determined by the Committee for the purpose of payments under the grant and new scheme above mentioned.

PLANTING NOTES.

Poultry: Prevention and Treatment of Fleas, Lice, and Mites.—Infestation is always worst in dirty and neglected runs and roosts, and such are a standing danger to more cleanly neighbours. Cleanliness and freedom will always put these pests under a disadvantage, not only cleanliness of the nests, walls, and floor, but also of the ceilings and perches. To suppress these pests the houses should be cleaned down at least twice a year with a wash made of hot lime and soft soap, the ceilings, walls, and nests having a good coating ; the wash should be fairly liquid so as to run into every crack and crevice. Early spring and autumn are the times for these applications. The perches are best treated with boiling water and soft soap, or with an emulsion of kerosene. It is important that houses should be well built, with as few cracks and crevices as possible, for in such harbours these pests congregate and may escape from any wash used.—*Proceedings of the Agricultural Society.*

Elephant Hunting in Siam.—The kraal is only a couple of a hundred yards from the river, and there is a funnel-shaped enclosure extending from the North Gate to the ford. Into this the animals are slowly led—for they must now be kept very quiet. One leader and then another passes through the narrow gateway, followed by some confiding friends. The decoys stand near by way of encouragement to those in the rear, which are imperceptibly crowded forward. A few get restless, but before long they are all safely in, and the trained elephants slip out through the other gate. Then it is that the wild ones realise that they have been trapped, and, madly eager to get out, trumpet, bellow, and groan ; creating, as a local paper truly said, "a scene of such confusion that no two people saw it alike." The walls now swarm with spectators, who amuse themselves by watching the bewildered beasts, some of which seem to resent their imprisonment, while others are indifferent, and others again engage in settling private quarrels, or roaring defiance at the gallery. One inquisitive youngster, that was destined for a civilised and useful life, tried to squeeze between the piles of the refuge, and got jammed across the ribs—the thickest part of his body. His efforts to get free attracted his friends, who watched him while he struggled and bellowed. One big fellow tried to push him back, but failed ; then there was a pause, during which one could almost see them thinking ; and another, having apparently worked it out in his mind, tried from behind, and, fairly lifting him, off his legs, pushed him through, amid shouts of applause from the crowd. —*From "Elephant Hunting in Siam," in the "Cornhill Magazine," for September.*

TO ALL PARTS OF ASIA, AFRICA, AMERICA AND OCEANIA.

Seeds & Plants of Commercial Products.

Castilloa Elastica Cervantes.—Orders being booked for the coming crop of seeds available in June and July, selected seed from very old trees. R. N. Lyne, Esq., Director of Agriculture, Zanzibar, writes under date 24th August, 1899 :—"Please send me 200 seeds of Castilloa Elastica for further trial; the seeds of Castilloa you sent me last August germinated very well." Price and particulars in our Circular No. 32; special quotations for large orders according to quantity; immediate booking necessary to avoid disappointment.

Hevea Brasiliensis (Para Rubber).—Orders being booked for the coming crop available in August and September, 1900. This is the only crop of seeds in the year. All orders should reach us before the end of July to avoid disappointment, as we have to make arrangements in time; guaranteed to arrive in good order at destination. We have already booked a large number of orders. A leading Sumatra Planter, who ordered 50,000 Hevea Brasiliensis seeds last year writes under date 27th February, 1900 :—"I received your favor of the 12th instant, out of which I learn that you booked me for 100,000 Hevea Brasiliensis seeds for August and September on the same conditions as before, but at the price of—— per thousand." Plants can be forwarded all the year round in Wardian cases. Price and particulars as per our Circular No. 30. A Borneo planter writes dating, Sandakan, 17th August, 1899 :—"The last lot of Para seeds turned out very well." Our shipments of Para plants last year has exceeded over 300,000 to different countries. Special terms for large orders on application.

Kickxia Africana (Lagos Rubber).—One of the staple articles of commerce in Lagos grow very vigorously, realizing over 3s. per lb. in the Liverpool market. Seeds and plants, price on application.

Hancornia Speciosa (Mangibeira Rubber).—Besides the value of rubber, it bears delicious fruits, which is a great favourite with the Brazilians, cultivated for both purposes. Seeds and plants, price on application.

Coffee Arabica Liberian Hybrid, *Maragogopie* Hybrid, C. Stanophylla and other varieties. Price of seeds on application.

Ficus Elastica (Assam and Java Rubber).—Seeds supplied with instructions; price according to quantity. This tree grows equally well in high and low land, in forest and grass land, its cultivation being extended largely by the Indian Government. For price of seeds with particulars as per our Circular No. 33.

Manihot Glaziovii (Ceara or Manicoba Rubber).—Fresh seeds available all the year round; price as per our Circular No. 31.

Urceola Esculenta (Burma Rubber) and **Landolphia Kirkii** (Mozambique Rubber).—Seeds and plants, both are creepers.

Cinchona Seeds.—Different varieties.

Sterculia Acuminata.—(Kolanut). Superior quality, seeds and plants; price on application, packed to stand the transit well for several months, a hardy tree, cultivation easy.

Erythrina Lithosperma.—Thornless variety, new crop of seeds ready in December, May and June. Price according to quantity on application.

Seeds and Plants of Cinnamon, Nutmeg, Clove, Sandlewood, Pepper, Cardamom, Vanilla, Cacao, Tea, Coca, Fibre, Medicinal and Fruit Trees, Shade and Timber Trees, Eucalyptus various varieties, also Palms, Bulbs, Orchids, &c.

Our enlarged Descriptive Price List of Tropical Seeds and Plants of Commercial Products for Foreign Countries for 1899-1900 are now being forwarded to applicants in different parts of the world. Also Descriptive Price Lists of Seeds and Plants of Fruit Trees, Bulbs, Tubers and Yams, and Orchids.

"South Africa."—The great authority on South African affairs of 25th March, 1899, says :—"An interesting Catalogue reaches us from the East. It is issued by William Brothers, Tropical Seed Merchants, of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbling. We recommend the great Powers and Concessionaries under them to go to William Brothers."

Our new Descriptive Price Lists of Seeds of Shade Trees for Coffee, Cacao, Tea, Cardamoms, &c., Timber Trees, Trees for Avenues, Hedges, Wind and Shelter Belts, Ornamental Trees, Shrubs and Climbing Plants; and Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons and Dracinas, now being prepared and will be ready shortly.

Special Arrangements made with foreign Governments, Botanical and Agricultural Departments, Planters and others for supplying seeds and plants of Commercial Products in large quantities.

Agents in London :—Messrs. P. W. WOOLLEY & Co., 90, Lower Thames Street.

Agent in Colombo, Ceylon :—E. B. CREASY, Esq.

Telegraphic Address : J. P. WILLIAM & BROTHERS,

William, Veyangoda, Ceylon. *Tropical Seed Merchants,*

Lieber's, A.I. and A.B.C. Codes used, Henaratgoda, Ceylon.

PINE HILL ESTATES COMPANY.

THE REPORT.

The report of Directors was as follows:—

ACREAGE:

Tea in bearing	...	279½ acres
Young tea 1898	..	31 ,,
do 1899	..	65 ,,
Cardamons	...	1½ ,,
Jungle and Patna	..	9 ,,
Fuel and Grass	...	11 ,,
Waste Land	...	1½ ,,
Scrub (disputed)	...	18
		416½ acres

The Directors have the pleasure to submit their seventh annual report.

The amount at credit of profit and loss account including R190·77 brought forward from last year's account is R10,804·67, out of which an interim dividend of 3 per cent was paid on 29th January amounting to R6,262·20

The Directors now propose to pay a final dividend of 2 per cent making 5 per cent for the year which will absorb 4,174·80

And to carry forward to next season 367·67

R10,804·67

The low prices ruling for the last six months are responsible for there not being a larger amount of profit available for distribution.

The crop of Tea realised from the estates was 131,947 lb., and from bought leaf 60,602 lb. as against estimates of 110,000 lb. and 40,000 lb. respectively. The estate tea showed an increase of 17 per cent on the previous season owing to a very favourable year. The net price realised was 38·96 cts. per lb. against 40·76 cts. last year.

The estimate of crop for the current year is 125,000 lb. from the estates and 50,000 lb. from bought leaf, or 175,000 lb. in all.

Factory.—The factory has now been completed, but the original estimate for the cost of the improvements was found insufficient, and it has been considerably exceeded.

The new clearing has unfortunately not been successful owing to unfavourable weather, and the expenditure on it has been heavy. It is hoped, however that the steps which have been taken to supply all vacancies will result in a good field of tea being secured.

According to the articles of Association Mr. Robert E Prance retires from the Board of Directors, but, being eligible, offers himself for re-election.

An Auditor for season 1900-1901 will have to be appointed.

KANDY AGRI-HORTICULTURAL AND KANDYAN ART EXHIBITION.

At the meeting of the Committee held last month, the following gentlemen were elected to form an Executive Committee:—Messrs. J H De Saram, L Creasy, J B Carruthers, T C Huxley, H F McMillan, E Beven, E Webb, Diwa Nilame, and Chief Interpreter, Kandy Kachcheri. The following sections for Exhibition were approved of and the details of awards have been left to the Executive Committee.

Section 1.—Flowering plants in pots, cut flowers in boxes, stands or glasses, ferns and orchids in pots, foliage plants in pots.

Section 2.—Fruits, vegetables, vegetable products.

Section 3.—Food products.

Section 4.—Cattle, poultry, dairy produce (butter, cheese, cream, and eggs.)

Section 5.—Preserved fruits, pickles, sweet meats, bread.

Section 6, *Art-work, &c.*—Gold and silver jewellery, brass and iron work, pottery, laequer work, models, masks, musical instruments, mats, baskets and fans, ivory and wood-carving, photographs.

Section 7, *Natural History.*—Collections of birds, butterflies, insects, shells, eggs, sporting trophies.

Section 8, *Miscellaneous.*—Fireworks, decorations.

Section 9. Oil machinery, machinery for the manipulation of Green Tea.

CACAO HOLDINGS UNDER SIXTY ACRES IN CEYLON.

Extracts from Minutes of proceedings of a meeting of the Cacao Committee of the Planters' Association of Ceylon held at the Victoria Commemoration Buildings, Kandy, on Friday, the 14th September, 1900, at eleven o'clock (11 a.m.) in the morning:—

CACAO HOLDINGS UNDER 60 ACRES.

Mr. Chas. Gibbon read the annexed abstract of Returns received through the courtesy of Government of Cacao Holdings under 60 acres. Resolved:—"That the thanks of the Cacao Committee be conveyed to Government, for the Returns furnished of Cacao holdings under 60 acres."

ABSTRACT OF RETURNS OF CACAO HOLDINGS UNDER 60 ACRES REFERRED TO.

	Holdings.		A. r. p.
Harispattu.			
Kalugammauasiya	382		298. 3.
Medusiyapathu	349		237. 3. 3.
Galasiyapathu 8. 1.		8. 1.	
		16. 1. 5	
		20. 3. 4	
		12. 0. 5	
		24. 0. 5	
		6. 0. 4	
		49. 0 0	
	.. 317	9. 1. 2	145. 2. 25
Pollgampaha (E. 40. 0. 0.)	.. 286		508. 1. 8
Arambapolla	... 454		191. 3. 9
Udagampaha	... 756	1,630. 0. 16	
Pollgampaha	.. 497	1,051. 0. 16	
Pallispattu	... 197	442. 1. 02	
do East	... 25	45 0 0	3,170. 1. 34
Udunuwara Gangapalata	.. 191		139. 0. 4
Udapalata	... 162		48. 3. 38
Kegalla	.. 266		505. 0. 25
Badulla Yatakinda (E 173)	.. 21		195. 0
Matale S. (63. 2. 0.)	.. 989		1,509. 2. 26
do N.	.. 118		123. 2.
do E.	... 39		69. 0. 0
N. Eliya (12. 0. 0 ?)	.. 9		26. 2. 23
We-uda (152).	.. 72		614. 2
do ..	.. 4		91. 2. 0
Yatinuwara (98.)	.. 23		203. 2. 7
Uda Dumbara (511)	.. 95		90. 0 0
Lower Hewaheta (Ampitiya)	.. 317		553. 2. 32
Udapalata	.. 236		242. 3. 18
(E 531. 2. 0)	5,805		8,967 3. 12

GRAFTING CACAO.

Resolved:—"That the attention of the Director, Royal Botanic Garden, be again drawn to the questions of grafting of Cacao, and also to Mr. Hart's remarks under date Trinidad, 13th September, 1898 (copy annexed) with special reference to the following sentence with a request that he will favour the Com-

mittee with his observations thereon:—"The course pursued has been to inarch a branch of a desired variety upon a well grown and healthy seedling, and the result has been that the union has taken place very freely, and there can be little doubt that in future any desired kind or variety can be perpetuated by this means." '

Mr. Hart's remarks, under date, Trinidad, 13th September 1898, referred to:—

Trinidad, 13th Sept. 1898.—It has on no more than one occasion been asked whether it is possible to graft Theobroma cacao and hitherto I have not been in a position to reply in the affirmative. I have now to report for the information of the Society that experiments have been carried out at the Royal Botanic Gardens, by inarching several varieties of cacao upon young seedlings with all the success that could be desired; and I hope that the grafted plants will be sufficiently hardened to be shown at the next meeting of the Society. The course pursued has been to inarch a branch of a desired variety, upon a well grown and healthy seedling, and the result has been that the union has taken place very freely, and there can be little doubt that in future any desired kind or variety can be perpetuated by this means.

I desire to point out the opening this process will afford for the extensive planting of any desired variety or kind, and that it will enable the planter to put samples of cacao upon the market with less variation in size and quality of the bean than has hitherto been possible.

I also desire to point out, that it may be possible, as it is with apples and pears in a temperate climate—by grafting weaker growing varieties upon kinds having a larger amount of vegetative vigour—to increase the yield of such kinds as that known as "Criollo," to as much as that of the more commonly productive varieties.

It will also be possible to maintain perfectly true, any kind which may have arisen from seed, on any plantation, and to preserve indefinitely any particular kind that may be desired. We have yet to prove, however, how the grafted plants will thrive, but judging from grafted plants of other kinds I see no reason to anticipate that there will be any difficulty under this head. I recommend the practice as well worth the attention of planters who have on their estates single trees, which are noted for the quality of the bean and the quality they produce.

CACAO DISEASE.

I have been requested by a successful and prominent planter, to bring up before the Society the question of disease among cacao trees in Trinidad for discussion. This gentleman has forwarded to me several specimens of (so called) diseased cacao, but after a careful and lengthy microscopical examination, I have not been able to say that the pod have been destroyed by disease. I am free to confess, however, that there is possibility of disease arising in any culture, and therefore in cacao; but I must reprehend as strongly as possible the spreading of views that we have disease of certain kinds until it has been fully proved that such do exist, as it is calculated to do an immense amount of harm to the cacao industry. A strict watch, however, should be kept for anything which appears to be of a pernicious character, and planters would, I think, do well to forward affected specimens to me, to be transmitted to mycological authorities, if necessary. So far, I may say, I have not found anything of a pernicious character; and I should be glad to hear my idea confirmed, that at present there is little cause for alarm.

(Signed) J. H. HART F.L.S.,

A FARMERS' EVERY-DAY LIFE.

NO. XII.

(By an ex-Ceylon Planter.)

AGRICULTURE

is still the chief industry of the country, although less attention is paid to its necessities that to any other; and now that we have got a member who does all in his power to help us, I think it would be very poor form indeed to try to oust him from his seat. He has fought well in the interest of the fishing population, and in return for that they have set up a herring-curer in opposition to him. Let it be so; but although I voted against him when he gained his seat, I hope to record my vote in his favour on the next occasion. He has championed the cause of farmers, and we are much in need of a few like him, seated in the House, for at present, I doubt if there are more than half a dozen legislators to defend the backbone of the country. Our member can honestly say that he has always worked for the good of the greatest number, a thing that but few can pride themseves on, for it often happens that, when one makes enquiries as to what number the average parliamentarian has worked for, it generally turns out to be *number one.* Successful farmers who have the ability have seldom the leisure to stand for their country, whilst there are any number of carpet-baggers stalking round, whose only qualifications for a seat in the House are the gift of the gab and no stake in the country whatever. I do not care what party is in power, so long as the best interests of our tight little island are properly attended to; and in the case of rural matters, I think that party feeling should be sunk altogether, and both sides of the House should strive to keep in a prosperous and flourishing condition that industry which, on its becoming unhealthy, has signalled the downfall of all the great nation of the past.

TILLAGE AND PASTURAGE

may be said to have begun with the creation of the world. Egypt, shortly after the days of Noah, became celebrated for agriculture. The first art learned by any rising nation was that of cultivating the soil. The ancient Romans were born agriculturists, and their most celebrated commanders were taken from the plough. To be a good farmer was accounted the greatest praise, and the very Senators cultivated their own ground themselves. With the decay of agriculture came the downfall of Rome, as will come the downfall of Britain, for when recruits can no longer be raised in our agricultural districts, and the nation has to depend for its fighters on the scum of the cities, in whom strength of body is about on a par with strength of mind, then will come the beginning of the end of our Empire, and legislators will remember, when too late, that they stamped out the greatest industry of the country, by encouraging the importation of cheap and nasty food from abroad, destroying the physical powers of the nation, and that courage which a conciousness of strength produces.

I have written, on a previous occasion, of the great rise in

THE PRICE OF COALS

during the past few months, the fears of a coal famine during the coming winter, and the national dread lest our mines prove to be almost exhausted. No sooner had I arranged for an extra supply of peats and firewood, as a set-off against the impending coal famine, than a writer to the Press,—one of those

great thinking men, trong on statistics,—springs on the nation the gratifying news that there are still 180,000,000,000 tons of coal in the mines of Britain, and that, at the present rate of consumption, the supply will last 500 years. That news has pleased me not a little: 500 years' supply will last my time, and, as posterity has never done anything for me, it can look after itself for all that I care. In the meantime the vision of myself and family, during the coming winter, seated round the place where a fire should have been, has been dispelled.

We have had a terribly trying time for

HAY-MAKING;

for weeks the rain has rained every day, and it has only been by fits and starts that the hay crop has been secured. It is an exceptionally good crop, however, and, as everything else, has been benefitted by the rain, we have no cause of complaint. I have had to endure much worse than this, when, in the middle of crop on the old coffee estate, the monsoon broke, and the rain poured down for weeks on end. The coolies, shivering with the cold, could scarcely pick the *palam*, which dropped and was washed down the drains. But when the season came to a close, and the estimate had been more than secured, the miserable time of picking was forgotten, and the warm rays of the sun dispelled from the minds of the coolies the recollection of the cold, wet and shivering season they had lately endured.

The abundance of grass has raised the price of

STORE STOCK

considerably, and the first of the lamb sales has gone off with a rise of from 5s to 8s a head on last year's prices. Let tea planters try to imagine what this means to grazers, by comparing these prices with the prices of their own staple. Supposing that a tea crop had sold, last year, at an average of 8d per lb., the planter would, no doubt, have been greatly pleased; but, supposing that the war in China, or some other cause had raised the price of the same crop to 1s per lb. this year, a princely fortune would appear tobe dawning on the proprietor. Such then has been the experience of the sheep farmer this year.

The cry out about

FINGER-AND-TOE DISEASE.

in turnips, which is usually heard at this season of the year, is ringing over the whole land, but the wailers never seem to think that they are themselves responsible for this most terrible disease. Perhaps, in the course of another generation, farmers will have learned to avoid, as they would the plague, manuring, with superphosphate, their turnip break, and will have given up that most deadly style of cropping known as the "five course shift." My land, which lies in grass for eight or nine years, has no sign of canker now. Indeed, I never saw a finer crop of turnips than that which I have this year, here or anywhere else. My next neighbour, who has followed my lead, told me the other day, that he has a field in turnips, this year, which had lain in grass for seven years, and he never had finer and sounder roots in his life. Another of his fields, however, which had only been in grass for three years, is now rotten from top to bottom. It takes a long time to drive a new idea into a farmer's head, but it gets there in course of time, and I hope yet to see this example bearing good fruit.—"*Cosmopolite.*"

TWO MAHOGANY LOGS FETCH £1,536.

Two logs of African mahogany were sold for the unprecedented amount of £1,536 the otherday at the auction sale of Messrs. Edward Chaloner and Co., at Liverpool. These logs formed one tree, and were bought to be cut into veneers to decorate the palatial residences of certain American merchant princes. The veneers are used in place of wall-papers, and, being beautifully figured, give a superb effect. The prices realised for the two logs were respectively 10s 3d and 7s 3d per superficial foot.—*Daily Express*, Aug. 27.

"CEYLON HANDBOOK AND DIRECTORY."

A new edition of this work has been in hand for some months back and a great deal of preliminary work has been done. The circular of estates and other Directory information was issued last month: and we invite suggestions from friends and others interested as to "improvements,"—"what to leave out of the bulky volume," and as to anything that is still wanted We have already received several communications on the subject, and we are bound to say they chiefly embody requests for "*more.*" We have promised in fact to try and give each *plantation's* TELEGRAPH as well as POST station: to show at a glance, the estates belonging to the several Limited Companies, or big individual proprietors; to give a list of all GRANT-IN-AID and PRIVATE Roads (always provided in these cases that the planters concerned are ready to co-operate). These are but a few of the "planting" improvements. In the bulk of the book there will be considerable changes, and although we are hoping to compress the volume a good deal (in regard to Agricultural information and Trade Statistics, etc.) we do not think anything specially required for reference will be omitted, while much that is new and useful will be found, added in. But to secure a really useful Book of Reference and Directory, there must be co-operation all round and every proprietor or manager should see that a return is filled up for *his* estate and sent in as per the Supplement issued last month while, as usual, we feel sure the Mercantile and Trading community of Colombo will do all that is required. From officials—heads of departments especially,—we always receive, and are sure still to receive, all the help we can require to make a volume which is in universal request as correct and complete as possible.

THE ANNUAL CROP OF MUSHROOMS in France is valued at £400,000, and there are 60 wholesale firms in Paris dealing exclusively in them. In the Department of the Seine, it appears, there are some 3,000 caves in which mushrooms are grown, and about 300 persons are employed in heir culture.—*Home paper.*

Correspondence.

To the Editor.

EXTRACTION OF RUBBER.

Etablissement d'Horticulture, Paris, le8me August, 1900.

DEAR SIR,—The system of extraction of India-rubber from the bark is now in full working order. Manufacture will be established before the end of October near Paris, and the Company asks for barks from all parts of the world for trial. Landolphia Hendelotii has proved till now to be the best producer of rubber mechanically extracted from the bark, as it is the most suitable for dry and sandy soils where no other plant will grow, so this plant should be a fortune on rich soils; but, many other plants such as Landolphia Kirkii, Vahea Madagascarensis Hancornia and a few Ficus are also good producers of rubber from the bark.

Apocynaceous plants seem, therefore, better designed for that purpose, and I believe it will be interesting for Ceylon growers to have their attention called to plants of this family. such as Cryptostegia, Beaumontii, Chonemorpha and others.

Chonemorpha macrophylla is a good producer of excellent rubber, but I have never received bark from old plants; but only from tender stems a few months old. In each sample rubber is found in the central part of the stem (moelle), but I believe it is the same in many plants when these are young. If you cut a stem of Chonemorpha in small pieces three inches long and let the milk coagulate in the open air, you will find a little piece of rubber large enough to repay the extraction by this very simple way; but I do not know if Chonemorpha is a quick-growing plant. I have only seen small plants in our houses.

I want bark of any producer of rubber and better of any lactiferous plant, for I have received bark of plants reported bad producers which have proved good for our system of extracting the rubber. People say this plant is not good, the rubber does not flow; but perhaps it is so much the better for our system because the rubber coagulated in the bark will be easily extracted mechanically. Where the latex flows easily in the rainy season, the bark is poor; where the latex does no flow in the dry season, the bark is rich: so much I can say actually.

I want only one kilo of each sort of bark, taken as much as possible on plants of known age. Where the stem is too small to permit to bring out the bark, kindly send one kilo of these stems; and believe me to be, your most obliged servant,

A. GODEFROY-LEBEUF.

CEYLON TEA IN NEW ZEALAND.

Dunedin, 13th Aug.

DEAR SIR,—I send you a Dunedin *Star* and some printed matter. When read, you will see the Tea Blenders here wish to kill the trade in "Pure Tea." Will you kindly criticise their action and the reports inserted by *Star's* Special Reporter as my own and Mr. ——'s opinions. I may state Mr. —— did a lot of damage three years ago by issuing a circular "Poison in the cup; Tea in lead packets." He makes a hit at cooly labour and coolies handling Tea.—Yours faithfully,

GEO. T. K. MACKENZIE.

TEA IN PACKETS IN NEW ZEALAND.

A petition was presented to Parliament today from tea merchants, timber merchants, manufacturers, tinsmiths and printers asking that a higher duty be imposed on teas imported in packages and boxes than upon those imported in bulk. The petition states that large quantities of teas are imported into New Zealand which have been packed outside the colony in packets and that coolie and other cheap labor is exclusively employed in preparing the packets and boxes in which the teas so imported are packed, and also in packing the teas. Tea merchants in New Zealand, they say, are placed at a disadvantage as compared with foreign tea dealers who can obtain labor for packing at nominal rates, and who contribute nothing to the Income Tax or the revenue of the colony and do not aid in the development of its resources If all teas were imported in bulk and packed in New Zealand large quantities of timber, paper and other material grown and manufactured in the colony would be utilised in the making of packets, boxes and cases and the industry would afford employment to large numbers of tinsmiths, carpenters and other artisans, and also young people. The petitioners therefore pray that an additional duty, say 2d per lb, be imposed on teas imported in packets and boxes weighing less than 30lb. net,

On the subject of the petition asking Parliament to place a higher duty on tea imported in packages and boxes than upon those imported in bulk we have interviewed Mr George M'Kenzie, of the Hondai-Lanka Tea Company, and he condemns the petition root and branch saying:

The Ceylon people are the only ones who put up tea in lead packets. These teas guaranteed pure, are sent to all parts of the world. The effectiveness of the guarantee cannot be questioned. All the packets put up in Ceylon are sealed lead packets. That sealing cannot be done here. The work is so fine that the ordinary plumber cannot do it. it was tried in London and failed. The lead packets put up here are not sealed. A blender can so blend as to get any profit he chooses, whereas the dealer who supplies lead teas does not interfere with the packets—he sells them as he gets them. All who import pure tea from Ceylon get about 1d per lb less profit if sold in sealed lead packets, because the sealed tea packet costs 1½d. and to put up the same tea in paper costs only ½d per lb. The large proportion of tea sold as pure Ceylon is generally made up of cheap Chinese, Fiji, or Java tea, which can be bought at a much lower price. It is well known that many thousands of chests of Chinese tea were destroyed on the wharf by the Customs, about four years ago. It was not allowed to be landed at Melbourne, and then was condemned in Dunedin. Fifteen thousand chests of the same, condemned in New York last year, were sent to Canada, and from there to England, and the owners could not get it in anywhere on account of its adulteration. I think it would be unwise to facilitate the putting-up of teas in New Zealand. You can buy tea siftings and dust for 2d per lb landed here, and this is the material used for adulteration purposes. If there were no lead packets the business would be entirely in the hands of two or three people, who could give any value they chose. The presence of the packet teas in the market compels the putters-up to maintain the standard. Some of those who were asked have refused to sign the petition, and some in the trade were not asked. I understand that only two or three Dunedin merchants signed it. As for the so-called encouragement of labour, two boys would put up in packets all the tea imported monthly in lead; one printer would turn out 5,000 or 6,00

labels in a couple of hours; the paper used cannot be made here; and there is a very small amount of timber used in making the boxes, for they are sent backward and forward and used again.

THE OTHER SIDE.

Having obtained Mr. M'Kenzie's statement, we deemed it a fair thing to interview Mr. N Harper Bell, who supports the petition, and his views of tea subject were thus expressed :—

The justice of the petition involves three questions—

1st. Whether it is better to have the tea packed locally or by coolie labor.

2nd. Whether there is any injustice to existing importers or to the public in prohibitory duty on the coolie article.

3. Whether the lead packages adopted in Ceylon are superior to the local methods of packing.

1. The tea at the gardens is graded, bulked, put into chests or half chests, and despatched to Colombo. There it is auctioned, and, according to the instructions of Home or colonial buyers, either despatched in original packages or repacked into small lead packets and boxes of from ½lb and 1lb packets to 5lb and 10lb boxes.

As originally purchased, it is extremely exceptional for a tea to combine all the qualities for which the consumer looks, and consequently, as much blending takes place in preparing the teas for the small packages in Colombo as in any other part of the world where such packing is done. The tea to be so blended is necessarily exposed, and in the hot, humid climate of Ceylon it naturally loses its aroma and fragrance at an infinitely higher rate than in a temperate climate such as New Zealand. It is even affirmed that a sample of tea left exposed one night on the liquoring table will be quite mouldy on the following morning. The handling and mixing are done by coolie labor under circumstances of climate, etc., which are, to say the least, not conducive to an improvement in the qualities of the tea. It can readily be seen, therefore, that if blending must take place, it is better that it should be done in New Zealand than in Ceylon. Blending is so absolutely a necessity that without it a very large proportion of the teas of the world would be unsuitable for general consumption. One tea possesses strength without sufficient flavor; another tea has most delicious flavor without the strength necessary for an agreeable liquor. Few original samples of tea, therefore, would meet with the approval of the public palate, which varies very much in different countries, or even districts. The expert blender in New Zealand, having a more certain criterion of the taste of his colony, has a great advantage in this respect alone. On all these grounds, therefore, the advantage to the public rests with the locally-packed article.

2. No injustice is apparently inflicted upon the present importer of coolie-packed teas if the extra duty be imposed, as the stock argument of such a dealer is invariably that tea is only locally packed for the sake of extra profit. In this regard it may be pointed out that inferior teas can be and are grown in all tea countries, but as the expenses of freight, duty, etc., etc., are equally heavy, no matter what the quality, the inducement to add rubbishy cheap teas to a blend is infinitely greater to a Colombo merchant than to a New Zealand one. Further, the argument that teas are only blended in the colony for the sake of mixing cheap rubbishy China tea, etc., with it is an insult to the public, who, in my opinion (after an experience of some sixteen years), are the best judges of a good cup of tea.

3. The question of the best way of packing tea in small quantities is one involving a certain amount of trade dispute. Most people are agreed that the lead package in vogue with the Ceylon packers is superior to paper as regards the retention of the finer distinctions of quality and flavor of the tea, but many people prefer the paper as offering less chances of lead or muriatic acid poisoning. The tin package gradually finding favor in this colony when made by the blocking process, entirely obviating the use of solder, possesses an advantage over the lead package in all ways, and quite overcomes the objection to the paper bag, the paste of which may be as prejudicial as the solder used with the lead wrapper. I has the additional advantage of being absolutely air-tight. Personally I have packed the Bell Tea in such tins from its inception, and although a more expensive way of packing the evident superiority of the method has met with public commendation.

THE DUTY ON TEA.

TO THE EDITOR.

Sir,—I see by last night's *Star* that the tea blenders have petitioned Parliament to stop by means of a forbidable duty tea in Ceylon sealed packets, their chief argument being that the work is done cheaper in Ceylon, and therefore in favor of the importer of such packets. This is not the case. It costs 1½d to pack tea in sealed lead packets and boxes, and the same tea would be packed in paper for ½d to three-eighths of a penny, besides being well blended with dust, fannings, cheap China, and other inferior teas for extra profit, and then put in a paper packet bearing the words "pure Ceylon tea" to mislead the public.

Tea packed in paper will not keep. From the day it is removed from the lead-lined chest in which it came from Ceylon, India, or China till it is used it is losing in strength and flavor. Believe me, but for the extra cost, no tea would be sold in paper bags.—I am, etc.,
EX-PLANTER.

August 9.

A COMPLIMENT TO THE "TROPICAL AGRICULTURIST."

Exposition Universelle, Paris, 1900,

Ceylon Section, Trocadero, Aug. 20.

Sir,—I enclose the card of a Mons. Henry de Varigny—a gentleman connected with *Le Temps*—who wishes to have future issues of the "Tropical Agriculturist" for review in his paper. I shall be glad if you will write to him and say whether or not you are disposed to accede to his request.—Yours truly,
W. E. DAVIDSON,

Delegate for the Ceylon Government at the Paris Exhibition.

Monsieur de Varigny is a remarkably-gifted man. He writes also for the French *Nature* and an Agricultural Review.—W.E.D.

[*Le Temps* being the leading paper in Paris, we take this as a special compliment—and agree to send on the *T.A.*—Ed. *T.A.*]

THE RIPENING OF BANANAS.

Galle, Aug. 28.

Dear Sir,—Anent the "fearsome story" about the ripening of bananas taken over from the *Westminster Budget*, the Sinhalese process of forcing on the yellow colour is certainly less objectionable. The plantain bunches are buried in the ground, and then fumigated till the ripening process is complete. Plantains treated in this manner have a very disagreeable taste.—Yours faithfully,
A.

FRUIT-GROWING IN LOWER AMBAGAMUWA.

Ambagamuwa, Sept. 5.

DEAR SIR,—I think it may surprise a good many that lowcountry fruits can be successfully grown at this elevation. On this estate, when I came to permanently take up my residence in 1889, I planted the following fruit trees :—Mangosteens 12 plants, 9 now growing, 2 bearing ; Ceylon plums (Uguressa), planted ½ dozen, 2 growing and in full bearing ; lovi-lovi, 2 planted, 1 in full bearing ; rambutans, 2 dozen planted, about 1 dozen growing, 4 in bearing ; num-num, 2 planted, one alive and in bearing ; billingberries, 2 planted, both growing and in bearing ; breadfruit, 4 planted, all growing and bearing profusely ; loquats, 4 planted, 3 growing and in bearing ; jamboos and rose apples, 2 of each in bearing ; oranges and mandarin oranges, a good many, all in bearing. I have even successfully grown peaches, two are thriving, one in bearing. Limes growing almost wild, cropping very heavily. Soursops on this estate and pomeloes or shaddocks go to feed even the coolies. Coconuts I planted about 300 and have about 160 growing luxuriantly ; two trees have borne this year. Thus you will see, sir, that Ceylon fruit, with care, can be successfully grown anywhere in Ceylon, save and except, I suppose, over an elevation of about 3,500 feet. Even this I would question.

I am sending you 1 mangosteen, 1 loquat, 1 num-num and some Ceylon plums and rambutans, the fruit now in season at this "packum." You will, perhaps, find the fruit not quite of such a flavour as the same fruit grown in the lowcountry, but I think you will say "They are not so bad." Your contemporaries would do well to copy this letter for the benefit of their readers.—Yours truly,

ADAM.

[The fruit sent to us look very well-grown, indeed, and are not without flavour, some being very good, the mangosteen and plums especially. This goes to show that every estate in the country ought to have a fruit garden of some kind ; for, undoubtedly, there are fruit-trees suited to each elevation from Colombo up to New Galway, where Mr. Kellow has done so much ; and to Nuwara Eliya, where Mr. John Cotton's growth of plums and strawberries is quite wonderful.—ED. *T.A.*]

RUBBER IN SOUTH AMERICA AND IN CEYLON, &C.

September 9th.

DEAR SIR,—I enclose an extract from *The Field* of 21st July last. The last sentence of the extract appears worthy of correction.—Yours faithfully,

PLANTER.

[The extract is as follows :—

The recent Consular Report on the great interior district of Brazil known as the State of Amazonas, presents itself rather as a description of the country from the pen of an observant traveller than as the list of exports and imports which constitutes the usual contribution to literature of Her Majesty's representative in foreign lands. Ten or twelve pages are devoted to an account of the rubber industry alone. Of late, the enormous consumption of this article in the manufacture of bicycle tyres has created an ever-increasing demand, and although the supply from the Amazon valley has trebled in the last ten years, the former average price of 2s 6d. per pound has now increased to as much as 4s 6d. The total world's output is from 120 to 130 million pounds, of the value of fifteen million sterling, and of this the Amazons supply not much less than half, though the crop obtained from East and West Africa is not far behind. A little comes from Malaysia, Madagascar, and Mauritius, and still less—some 500 tons—from India and Ceylon, but South America is not only first in quantity, but in quality. The low-lying land chiefly affected by the rubber-yielding trees is completely submerged in the rainy season, which lasts from January to July, so that collecting is only possible during the last five months of the year. The trees yielding the latex are the *Manihot Glaziovii*, chiefly worked in Ceara, *Hancornia speciosa* the mangabeira of the natives, which is beginning to give results in Maranhao, and *Hevea brasiliensis*. The latter, however, is infinitely the most important, the bulk of the caoutchouc being obtained from it. It is, nevertheless, by no means common in the forests, an average of one tree only to every two acres being good ground. The yield of each tree when worked under satisfactory conditions is not more than from 2 lb. to 3 lb., but though a rest is from time to time necessary, the latex may be drawn for many years without causing the trees to perish, as has been generally supposed. It is therefore improbable that the available supply of rubber will be exhausted in the near future, and, owing to the enormous area over which the tree is found, much of which still remains to be exploited, it is unlikely that the industry will fall off. At the same time, however, attempts to cultivate the tree from seed in Africa and Ceylon have not hitherto been successful.

We take to ourselves blame for not correcting *The Field* long ago. It is quite a mistake to say that the experiments in Ceylon to grow rubber trees (Para especially) from seed have not been successful. Only the other day a small consignment of Para rubber taken from trees in Ceylon realized in London 3s 7¾d a lb. and we hope to see the export increasing year by year now.—ED. *T.A.*]

TEA FREIGHT TO AUSTRALIA.

Colombo, Sept. 17.

Dear Sir,—The accompanying letter, addressed to the Vice-Chairman of the Chamber of Commerce, should be of general interest to both growers and dealers in Tea, and I send it to you for publication should you care to insert it.—I am, dear sir, yours faithfully,

H. WALTHEW.

R50 PER TON FREIGHT TO AUSTRALIA FOR TEA.

Colombo, Sept, 17, 1900.

To the Vice-Chairman, The Ceylon Chamber of Commerce, Colombo.

Dear Sir,—There has practically been a tacit contract between shippers to Australia and the mail steamers that freight should be paid and received at R40 per ton, and although all shippers know the rate to be excessive, they have paid it without a murmur or agitation, feeling that the advantages of a regular mail service compensated largely for this exorbitant charge. Shippers have borne without serious protest the curtailment of space to a point which has practically starved the Australian Markets and permitted other growths (to the incalculable injury of the Ceylon Tea Industry) to find a Market in Australia which they never would have done, if freight space had been plentiful at a time when Australia was starving for the produce of our Island. The mail steamers,

during the past four months, have ignored the wants of our trade, or perhaps more correctly speaking, they have not made arrangements to fulfil the requirements of the Tea Trade, notwithstanding the fact that they have to call in at Colombo for coal and passengers, and will always find ready for them 300 tons of cargo at £2 13s 4d, netting £800; practically sufficient to pay their coal bill to take them down to Australia

The R40 per ton freight which is charged to shippers to Australia equals about 4¾ cents per lb. calculated on the basis of 850 lb., being the average nett weight of a ton of 50 c-ft. of Tea. This is as much as is paid on tea to any port in the British Empire inland and transhipped either at New York or London as far west as Ontario in Canada, or as Far East via Hongkong and the Pacific as British Columbia, and is 25 per cent more than is paid to Australia from Calcutta.

As the Australian Colonies are the principal outlet of teas sold in Colombo, the buyer here has to deduct the extra price of freight which he is paying from the price he pays to the planter, and so the whole industry suffers through shippers having to pay to the mail steamers running to Australia, this excessive rate of 4¾ cents per pound.

We have now arrived at a point when Ceylon tea is so well-known and so well-liked in Australia that the trade requires more freight space to carry the produce of the Island to the Australian markets, and our nominal friends, the Ring of ship owners, whom the trade have been supporting at the above mentioned rate of R40 per ton for so many years, now turns like the proverbial viper and advances its rates 25 per cent or 1¼ cent per lb.

The tea trade of Ceylon is no doubt capable of bearing this blow with fortitude, feeling that the mail steamers are only buying at their own expense the means of bringing in outside steamers to compete with them at a much lower rate of freight, thus helping to break the iniquitous monopoly which has been saddled on the trade of the Island. But the question goes deeper than the question of breaking a monopoly; it is the question now of the Steamer Agents having broken a tacit contract. Speaking for my firm, I should be very pleased to see a much heavier rate of freight imposed for the next month or two upon all tea to Australia, as I happen to have shipped my quantum for a little time at R50 per ton, but the point of the sudden demand upon all Australian shippers, to pay R50 per ton is the absence of consideration for the traders who have supported the mail companies. Many merchants in the Fort have calculated their orders upon a R40 per ton basis, and they have bought to ship at R40 per ton freight. If they suddenly without warning or notice, are called upon to pay R50 they themselves have to bear the loss of R10 per ton. If the mail companies wish to charge shippers R50 per ton, then it is only just and fair that they should give the shippers due notice of their intention. If this had been a port where the freight rate to Australia fluctuated according to the law of supply and demand, no fault could be found with the mail companies in their present action, but however large the space offering here and however small the amount of cargo obtainable no mail steamer breaks the rule of their "Ring."

There has been many a time of depression in tea which could have been relieved, had a steamer come in with empty space and offered same at a low rate. But the "Ring" which manages the mail steamers have no consideration for the industry of the island or her traders: they feel that they have a monopoly, and can take extravagant liberties with the trade as is the nature of mono- polists.

I think the time has come when the Chamber of Commerce should enter a serious protest against the monopoly and against the arbitrary raising of rates without notice, and I think that I am not going wide of the mark, when I make the statement that if a body of shippers were to bang together, a Line of steamers could be chartered, to call in here monthly to carry the tea export of this island to Australia at 35s, thus saving ½d per lb. on the present rate of R40 per ton.

If the ship-owners maintain this rate of R50 per ton, planters from next Wednesday's sale onwards will note a fall in the value they obtain of one to two cents per lb.

I should like this letter to be put before the Committee and with your approval I should like to publish it.—Yours faithfully, H. WALTHEW.

THE SALE OF PLUMBAGO.

(To the Editor "Times of Ceylon.")

Sir,—We have been much interested in the editorial and comments on the subject of plumbago, which have arisen from our original letter to you on the subject. It would appear from suggestions that have reached us, that if a definite *modus operandi* were formulated by which the producers could deal with the consuming centres *direct*, they would be glad to avail themselves of such a system. There are two suggestions we notice, made you which present possible difficulties to be overcome:—

(*a*) That the article requires preparation after it leaves the producers' hands before it can be used.

(*b*) That the non-success of the produce-consumer principle in tea may apply also to plumbago.

The former could be obviated by handing the rough plumbago to one of the Colombo curing firms who undertake to prepare at a fixed rate, or, if the output of the mine was sufficient, it would pay to erect a curing shed and do the work there. We have heard of a firm of curers who, after curing a parcel sent to them for cleaning, refused to allow the mine-owner to ship his plumbago himself, instead of selling it to them as he had been previously accustomed to do. The owner very properly resented such high-handed treatment and started curing himself. Producers, however, should have no difficulty in finding curers to do this work at fixed charge. The reasons of the failure to sell teas direct to the consumer are so obvious, that it is hardly necessary to deal with them in detail. The sale of plumbago, however, is on different lines. The main point to be remembered is that, in tea, the average consumer is a private individual, who buys a pound at a shop within a few yards of his house. In plumbago, the consumer is a large manufacturer who can buy 50 tons at a time. The factory may be situated in the interior of Europe or the United States, and may require a certain time in which to pay for its purchases. To sell to it would, therefore, necessitate an organization which is prepared to take charge of the shipments of plumbago on arrival, deliver it to the factory door, and if necessary, to wait till the factory settling day for payment. If this could be done the producer would be getting the utmost value for his article, as he would be getting *the actual price the consumer pays.* To arrive at this we make the following proposal to those interested in the sale of plumbago:—We are prepared to organise a six-weekly auction sale in London of all the plumbago sent to us for realization. In good time, prior to the sale, we will, as is the custom with the Government sales of ebony, forward to every consumer in all parts of the world, catalogues and samples of the different parcels. We will offer to these latter to take their limits for purchasing in auction, and should they secure the parcel, forward the goods to their port, giving them the necessary facilities for payment. It would not be advisable to hold sales at a less interval than six weeks, as sufficient time would not elapse between the receipt of samples by the manufacturer and the date of sale to allow him to *write* fully as to his requirements; and orders cabled by him would not lend themselves to full and complete instructions regarding his needs for any special quality or quantity. This

will afford the consumer every inducement to purchase through us, as he will see exactly what he is going to buy—an important point—and know that he is buying at first hand—a condition under which, it is interesting to note, he is often prepared, from a sentimental point of view to bid more freely than if he thinks he is paying somebody else a profit. The concentration of bidding thus obtained should show favourable results for producers. We would credit the producer with the actual price thus obtained, forwarding official voucher if necessary. For doing this, that is, circularising prior to sale, selling, shipping to buyer, and, if necessary, giving the latter credit, we would make an inclusive charge to producer of 5 per cent, paying out of this any brokerages or agents' commission we may incur for the better sale of the goods. The above, we think, would offer a means by which the producer should get better prices for his staple than by any other method. But, if we are to make this successful, it is absolutely essential that we have the confidence and support of the producers. It would be of no use our endeavouring to concentrate all the buying of plumbago into one channel, if sales are at the same time being encouraged elsewhere. The assortment which we offer for sale must be sufficiently varied and tempting to compel the buyers in all parts to come and bid up in the sale for their requirements, and the sale would then come to be regarded as the recognised channel of supply. If the producers of plumbago in your island would only take the trouble to investigate the present *modus operandi* of disposing of their consignments, we feel sure they would be anxious to at once effect a radical and sweeping change. The market is largely controlled by one or two brokers, whose interest it is to befriend the manufacturer to the detriment of the unfortunate consignor whose goods *must* be sold. There is no proper organisation or concentration of the buying element, as in tea, and we *know* of many cases where plumbago owned by natives and others has been sold much below its value, merely from the fact that buyers on the Connent and in the States have not been thoroughly advised before the sale.

We shall be glad to receive communications from any producer on this important subject, and give them any information they may require.—Yours, &c.,

CHAPMAN, ANTHONY & CO.

15, Philpot Lane, E C, London, 24th Aug., 1900.

COCONUT PLANTING AND NATIVE ENTERPRISE.—We are interested to learn of the success of a retired native gentleman in the cultivation of a coconut property of rather more than 100 acres in extent. When it was acquired by him, over three years ago, it was bearing an annual crop of 73,000 nuts. By judicious and liberal manuring the present proprietor, who is dealing with his soil in a bold and enterprising manner, has succeeded in raising the crop to 123,000 nuts per annum—but hitherto he has consistently allowed his expenditure to exceed his income. He spent more than R5,000 last year on the cultivation of the estate and next year expects the income exactly to cover his expenses. Subsequently, he expects to reap a handsome profit and is fully confident that the yield in a few years more will reach the high figure of 600,000 nuts. The planter in question, as may be guessed, is a gentleman of original ideas and fond of experimental work. We shall watch with interest the results of the present experiment in the "high cultivation" with our great palm staple. Old Mr. Lamont has said there is scarcely a limit to what the coconut tree will utilise of manure and that for every rupee spent on fertilisers, *two* at least should be got back.

ARBORICULTURAL OPERATIONS IN INDIA.

We have received a copy of the Report on the Arboricultural Operations in the N.-W. Provinces and Oudh, for the year ending March 31st, 1900, of which Mr. W. H. Moreland, Director of Land Records and Agriculture, is the author.

We learn from the Report that 2,213 of the total 2,919 miles of metalled roads, and 4,872 out of 23,220 miles of unmetalled roads, have now been provided with avenues of trees. In 1898 special instructions, intended to encourage the planting of trees by private individuals were issued by Government; but these were issued too late for results to be apparent in the figures for last year, though the Report mentions several instances where private persons have started avenues from one to four miles long. It is expected that arboriculture can be materially extended in this way, through the personal influence of the District Officer. It would appear that it is possible to maintain nurseries in that special expenditure, namely by putting them in charge of road coolies and those in charge of road bungalows.

As regards supervision, operations on Provincial roads remain in charge of officers of the P. W. D., while those on local roads are, as a rule, supervised by officials of the District Staff representing the executive of the District Boards.

The financial results of last year show the aggregate receipts as R84,988 or R500 in excess of the previous year's income: on the other hand the expenditure rose by nearly R8,000, and amounted to R89,196. The Provincial roads show a handsome profit, while there is a deficit on the roads managed by the District Board. This result is due to the administration of the former being closer, while the established avenues are considerably larger; so that while there is little expenditure, there is at the same time an income drawn from them.

TEA CULTIVATION IN INDIA.

The Director-General of Statistics publishes a paper in which he shows all India to have 516,732 acres under tea; but Mr. O'Conor confesses that his figures are imperfect and defective, information being withheld in some cases. We shall give the details later; but meantime we may mention that 33,279 acres of tea are put down for Travancore and the Madras Presidency, and it is estimated that in all India 15,052 additional acres of tea were planted in 1899; 31,561 in 1898, and 36,838 in 1897—thus showing how the higher rupee checked extension. It is stated that last year gave a wonderful increase (23½ million lb.) in production, but this is not borne out by the exports? Mr. O'Conor gives the consumption of tea in India on the average of five years at 5,169,000 lb. of Indian tea and 2,723,000 lb. of foreign tea (chiefly Ceylon). Of course, this could be largely increased if once the millions of India (as in China) took to drinking tea.

SCENT FARMING.

London, Aug. 30.

I heard the other day from someone who ought to know that there is a great opening for "scent farmers" and "growers of sweet herbs." I can believe that this branch of agriculture would be especially pleasing to female gardeners, for it conjures up at once a dream of fragrant perfume, and certainly the cult of sweet lavender and the tending of the modest rosemary should be more attractive than cutting cabbages and digging potatoes. All that is required is pluck and a small amount of capital to start a scent farm. Land, of course, is the principal difficulty. For the raising of lavender the soil must be of deep, sandy loam, if possible overlying chalk. An acre of lavender in good condition is calculated to yield £50 in a season. English lavender is the sweetest in the world and the demand for it is great. It is hardy and needs but little cultivation. There is a typical scent farm at Wallington, near Croydon, and there is no question of its financial success. For miles round the Crystal Palace and the Epsom Downs are fields of blue lavender. The cultivation of rosemary too and of the more plebian peppermint is an occupation with money in it, and I cannot help thinking that it is work essentially fitted for gentlewomen and it might succeed the violet growing. I am told also that a dairy farm managed by ladies would prove most financially successful at any of our crowded seaside resorts. Milk, eggs, and poultry are not to be had for love or money by visitors, most of the country people being pledged and bound to send their produce to London direct. Kitchen garden produce, we all know is most difficult to be obtained at crowded seaside places. I really believe a very lucrative business might be done by ladies able to supply farm produce, vegetables, fruit and flowers to visitors at any of our rising seaside resorts.

A SCOTCH FLOWER SHOW.

I was much pleased by a visit I paid the other day to a country flower show in a remote village amongst the Scotch hills. Such potatoes! such beans, leeks and onions! I never looked on before above ground. Carnations of every shade of colour and of enormous size were stuck in ginger-beer bottles, with a circle of paper round each separate bloom. Deep purple and variegated pansies were displayed on white cards. Bridle bouquets made up of pure white flowers, even baskets for table decoration, were all there, artistically spread out upon the schoolroom tables and desks. But what pleased me more than any of these most creditable exhibits from the gardens of the cottagers were the collections of seeds and fruits made by the boys of the village and the pretty bouquets or "boggies" of wild flowers gathered and arranged by the little girls attending the school. In one boy's collection of wild fruits and seeds 100 different varieties were found, all neatly arranged upon a square sheet of green moss, fir cones, wild raspberries, bilberries, acorns, beech nuts, chestnuts, etc., all collected and carefully arranged by the boy (the first prize winner) himself. I am told that the village schoolmaster (who is somewhat of a botanist) encourages his pupils to employ their leisure hours in searching the neighbouring woods and moors for these botanical specimens, and is most kind in assisting them to name and arrange their treasure trove. What an intelligent and enlightened schoolmaster for an obscure country village in the hills amidst the sheep and the heather! Would that there were more such in our rural villages and hamlets to influence so wisely and intelligently the tastes and pursuits of the rising generation—the youngsters of our country cottage homes.

I forgot to say that rows and rows of competing scones, oatcake, butter, cookies, and home-made jam reposed upon shelves all round the room. I felt so much inclined to test personally the virtues of these fresh and tempting exhibits. I was told that a very handsome prize had been offered at a neighbouring village for the largest collection of queen wasps, and that over 500 had been produced by one small boy. A perfect terror amongst wasps that boy must have been.

PENELOPE.

FORESTRY IN BRITISH INDIA.

BY B. RIBBENTROP, C.I.E., INSPECTOR-GENERAL OF FORESTS, TO THE GOVERNMENT OF INDIA.

A copy of this valuable work has come to us. Its object is explained in a prefatory note:—

The end of my career in the Indian Forest Service is drawing near. It has extended over thirty-years, and though I was not in the country when regular forest conservancy was first introduced under the auspices of Mr. (now Sir Dietrich) Brandis, I arrived when it was still quite a small sapling, and I have seen it grow to the mighty tree it is at present, under the wide-spreading shadow of which I have grown old. This is my excuse for preparing a general description of the forests and a resume of the introduction and growth of forestry in the British Indian Empire, to the publication of which I have obtainted the consent of Government. I am, however, solely responsible for the matter, the form, and the opinions expressed.

The contents are as follows :—

Physical possibilities of India as a forest-growing country; Evergreen Forests; Deciduous Forests; Dry Forests; Alpine Forests: Littoral and Tidal Forests of Burma and Bengal; Riparian Forests; Zones in which no forests grow; Influence of man on the Indian forests; Influence of forests on the climatic conditions of a country; Local influence of forests on the fertility of the country; Early forests policy after British occupation; First attempts at forest administration; The dawn of Forestry in India; Present forest administration and its development; Organization of the Forest Department and its growth; Proprietary status of forests in India; Forest laws; Constitution of State Forest property; Further progress of constitution of Reserved forests under modern legislation; Forest Settlements; Demarcation; Forest Surveys; Working-plans; Communications and buildings; General protection; Protection from fire; Grazing and browsing; Sylviculture; Arboriculture; Works of improvement of existing forest growth; Exploitation and outturn; Minor forest produce; Financial results of Forest Administration; Technical education; Indian forest literature; Forest Administration in Native States. Appendices.—(i) Chart of the average annual rainfall of India (mentioned at page 6). (ii) Map showing the description of distribution of Forest lands under Government control on 30th June 1899 (mentioned at page 123). (iii) Map showing the advance made in Forest Surveys up to 30th June 1899 (mentioned at page 130). (iv). Map showing the advance made in Working Plans up to 30th June 1899 (mentioned at page 139).

The maps are well-executed and very interesting,

WHEAT CROP OF THE AUSTRALASIAN COLONIES.

	1898-9.	1899-1900.	
	Bushels.	Bushels.	
Queensland	607,012	611,414	——
Victoria	19,581,304	15,205,350	Dec. 4,375,954
N. S. Wales	9,286,216	13,585,277	Inc. 4,300,061
Sth A'tralia	8,778,900	8,453,135	Dec. 325,765
New Zealand	13,073,416	7,695,121	Dec. 5,378,295

—*Queensland Country Life*, Aug. 23.

THE CONGO STATE AND COMPETITION: DESTRUCTION OF RUBBER.

A very favourite argument used by the admirers *quand meme* of the Congo State consists in the oft-repeated statement that the country is being developed and is becoming prosperous by the introduction of fresh capital, &c. If by ruining acres of valuable rubber-producing forest land, by depopulating entire districts with fire and sword, by causing thousands of natives in Congo State territory to cross the river into French territory, in order to get quick returns, development is secured, then the country is being developed—not otherwise. Does the circumstance that since 1892 rubber in increasing quantities has been exported and many new rubber-exporting companies formed, prove that the country is becoming prosperous? Let us see. In 1897, 1,662,380 kilos of rubber were exported from the Congo State. Out of these 1,662,380 kilos of rubber *no fewer than 1,071,499 kilos came from the Domaine Privé!* Out of the 1,071,499 kilos, the *Domaine Privé* "taxes" accounted for 721,541, the balance of 349,958 being supplied by the two companies, Société Anversoise du Congo and Abir, in both of whom the Congo State, as already shown, is interested to the extent of one-half the shares. Deducting the output of the *Domaine Privé* from the quantity of rubber exporetd, there remains 590,881 kilos to represent private enterprise. A further examination reveals the fact that one singe company, the Société Anonyme Belge du Haut Congo, the absolute genuineness of which, as a strictly private company without State participation in profits, operating *outside* the *Domaine Privé*, is doubtful (see footnote, Article III.) exported 458,862 kilos out of the 590,881 kilos remaining. So that all the other companies put together merely succeeded in shipping home in 1897 a paltry 142 tons, reckoning 1,000 kilos to the ton! Does this indicate prosperity? Take ivory. In 1897 the Congo State exported to Belgium 289,117 kilos of ivory. Out of this total the *Domaine Privé* produced 198,326 kilos! The export of other products is insignificant. The facts speak for themselves. There is nothing in the remotest degree approaching a genuine increase of prosperity in the Congo State. Private enterprise in three-fourths of the territories is simply non-existent, and even in the nominally Free Trade zone the legimate barter transactions of independent traders are hampered at every turn by the proceedings of the official taxgatherers, who use coercive measures to compel the natives to pay in taxes the products of the forest which they would otherwise exchange against Europen goods. The increasing magnitude of the rubber exports from the Congo State since 1892 is due therefore not to legimate commerce, but to slave labour. Remove that slave labour and the bubble of "prosperity" is pricked.—*Speaker*, Sept. 1.

THE LAST LONDON CINNAMON SALES.

The third quarterly cinnamon sales for the year, held in London on 27th August, appear to have gone off very satisfactorily for sellers. When noticing the May sales the following month, we suggested an explanation for the drop that was then recorded, in the heavy catalogue, and the trade disturbance caused by the South African war; and we expressed the hope that, unless our exports continued to advance, there would be a recovery from the slight falling off. As it turned out, there has been no diminution in our cinnamon exports—quilled bark being in excess of the quantity sent away last year, and the shortage as compared with 1897 and 1898 being more than made up by the increased output of chips; and yet the prices show a good advance, with a brisk demand.

Although the report we append speaks of a moderate supply, it will be seen that the quantity catalogued was in excess of that brought to hammer in August last year, and yet—what very seldom happens—almost the whole quantity was knocked down to bidders—all but 8 bales out of 1,141! And how this happened, with an advance in prices of from 1d to 4d—surely a most exceptional experience—is told in a very business-like way in what follows. At the commencement of the sale, it looked as if the easier prices of last May were to rule again; but a brisk competition soon established itself; and prices were forced up almost irrespective of grades. We are not told what excited the unlooked-for competition; but the caution should be noted that this ignoring of qualities and grades is not an experience to be calculated on, as it did not express any particular feeling in the spice market. Probably some broker put in a bid for a mark of which another had long a monopoly, and that led to fancy prices; for it is well-known that some of the best marks are almost invariably bought for Spanish Firms; and Spain has evidently recovered sufficiently from the debilitating war to be able to resume trade on the old lines.

Even more satisfactory than the advance in prices of plantation spice, is the neglect of "wild bark. The former was due to some exceptional local condition; the latter indicates the continued resolution of the trade, as expressed at previous auctions, to have nothing to do with spurious bark. If exporters have not already learnt the lesson that it cannot possibly pay them to send stuff for which no one bids, or which fetches 1d a lb., they will soon be convinced of the futility, and that will help to maintain prices for honest spice.—We quote as follows from Messrs. Forbes, Forbes & Co.'s Report on September auctions:—

London, August 23.—*Cinnamon.* At the quarterly auctions held yesterday the supply was moderate, viz:—1,141 bales Plantation quill, against 1,202 bales at the previous sales, and 959 bales at this period last year. We are pleased to report an exceptionally brisk demand, and the clearance of all but eight bales.

The "worked" cinnamon comprised 305 bales, and the "unworked" 836 bales. The "unworked" quill chiefly sold at about ½ to 1d per

lb. dearer; firsts 9½ to 1s 1d; seconds 9½d to 11d; thirds 9½d to 11d; and fourths 8d to 9d per lb. A few lots of native growth sold at 2d to 7d per lb. for fifths to firsts.

The sale of the "worked" cinnamon was very exceptional, and for most of the marks the increase in price ranged from 1d up to 4d per lb. The opening bids for the leading mark were cautiously made, and it appeared that easier prices were likely to be established.

As the lots progressed, a strong spirit of competition set in between two or three of the leading buyers, with the result that prices were forced in some cases 2d to 4d per lb. firsts, seconds and thirds occasionally being practically bought at nearly the same price. Some lots sold at exceptionally high prices; these, however, must not be taken as representing true market value, and such prices are not likely to be obtained again.

Firsts realized 1s 1d to 1s 8d; Seconds 10½d to 1s 7d; Thirds 9½ to 1s 7d; Fourths 8½d to 1s 1d per lb.

About 1,300 Bales wild Ceylon were quite neglected and all bought in. Of low chips and bark, some 1900 bags offered and were nearly all, withdrawd for lack of bids, a few bags Bark being sold at 1d, Chips 3d and Quillings &c. 6½ to 10d per lb.

Stocks of Ceylon 2,544 bales; Wild 2,581 bales; Chips 5,205 bags; and Wild Bark, &c. 8,937 bales.

Next Auctions 26th November.

Forbes, Forbes and Co., Ltd.

CEYLON IMPORT DUTY ON TEA.

Ceylon imposes a 25 cents import duty on all foreign teas coming into the Island. The abolition of this altogether unjustifiable duty has all along been opposed by Ceylon planters. The *Ceylon Observer* suggests that the Planters' Association should move the Imperial Customs officials to fix a proper tea standard so as to exclude rubbishy and worse teas. The unfortunate part of the business is that Ceylon alone dees not suffer, our produce likewise gets a bad name. People in Australia and other parts of the world are not, generally, sufficiently well versed in geography to distinguish between Ceylon and Indian teas—to them they are one and the same. We think that all the Tea Associations (London, Indian and Ceylon) should take cognisance of the matter, and, working in unison, adopt measures to move Her Majesty's Customs to fix some proper standard at all ports, so as to prevent the shipping of rubbishy teas, and worse, from the countries of production. We have never been able to understand the action of the Crown colony imposing a 25 cents import duty on our produce considering that its teas are admitted free into this country. The tax is undoubtedly detrimental to the best commercial interests of the Colombo port, as, were it not for this prohibitive duty, Southern Indian tea at least would be shipped for sale to that mart. Some time ago we suggested Indian teas being shipped to Colombo and there blended and sold, making that place the great Indo-Ceylon mart for all Indian and Ceylon teas. The suggestion, for obvious reasons, met with no favour. and our fellow-planters in the Island were dead against it, for it of course meant the abolition of the 25 cents import duty. We trust that they will now see that the retention of the tax is opposed to their best interests. A fixed and proper tea standard by Her Majesty's Customs would do away with all necessity for the duty, and its abolition would lead to a great expansion of business in Colombo; which would greatly benefit the Island in very many more ways than one.—*Indian Planters' Gazette,* Sept. 8.

BOOK RIFLES FOR SMALL GAME IN CEYLON.

(To the Editor of "The Asian.")

Sir,—In a recent issue of your valuable journal I noticed a most interesting article by your constant correspondent, "Fleur-de-lys." He brought to the notice of sportsmen a branch of sport few realise the existence of—myself amongst the number—*viz*, the excellent rook rifle practice to be had at small game of which there is an abundance in the low country of Ceylon, and which offer absolutely no sport with the gun. In the tank country flamingoes and the larger kind of water birds, inland jackal, big squirrels, hares and pigeon of various kinds are very plentiful, and afford splendid tests of skill with the small-bore rifle, while there would be no fun in shooting them with a shot gun. It is only done when shooting for "the pot" and when there is no danger of disturbing better game. The great objection, in Ceylon at any rate, is the necessity of taking an extra rifle for two reasons, *viz.*, (1) the wrong weapon is sure to be handed to you by the wretched 'trackers' (?) we have to employ; (2) the great trouble of having to keep an extra gun clean—this is no small consideration out here as our servants are quite incapable of keeping firearms clean, more especially small-bores, which they soon succeed in chocking: if you value the weapon you must clean it yourself. However, your correspondent suggests the use of a weapon which is adapted to shoot with a reduced charge. With this end in view I have been experimenting with a breech adaptor and the miniature cartridges in a Martini-Metford ·303 by Rigby. I may be unfortunate with the ammunition, but the accuracy with these cartridges has been most disappointing. What diagrams would your correspondent (who is undoubtedly an expert) think possible at 50 and 100 yds.? Has he, or any of your readers, had any experience with the latest American rifle, the Savage, which Messrs. Westly Richards have taken up the agency of? This rifle has a most taking appearance, being hammerless with a self-contained magazine (6 shot). It shoots a nickel soft-nosed bullet with very much the same velocity and force of the British ·303, and it also has a miniature cartridge which is claimed to shoot with great precision up to 100 yds. The price is also most reasonable, *viz.*, about £4-0 0. Any information on this subject from any of your readers will greatly oblige others as well as—M. L. W.—Madulkellie (Ceylon), 30th August, 1900. —*Asian*, Sept. 11th. [The above initials will be recognised at once as those of a well-known young Knuckles planter and sportsman.—Ed. *C. O.*]

Short Crop of Cacao in Central America.—Up to the present time the shortage of cacao from the Machala and Santa Rosa districts exceeds 10,000 bags says a Guayaquil correspondent of the *B. T. Journal*, of July 15. This represents an average value of a quarter of a million sterling, or one-fifth of the exports. Not only does this alone cause a despondent feeling in commercial circles, but the civil war in Colombia along the Ecuadorian frontier also has a bad effect on trade. The export tables of coffee, rubber, hides, and vegetable ivory or tagua show that there exists a considerable amount of excessive trading as well as speculation.

AN INDIAN TEA CESS AND THE CEYLON TEA DUTY.

It is very gratifying to us to see both the Indian and local press now so generally taking up subjects which, for a long time, we urged almost as one crying in the wilderness. We refer to the need of pressing on the Indian Tea planters and also the Government, in season and out of season, the need for establishing a Cess Fund for advertising their tea in new countries, after the pattern set in Ceylon; and secondly the need for abolishing the unwise, inequitable and anomalous import duty on tea in Ceylon. It is well-known that its existence has already cost Colombo much business not only in the handling of the teas of Travancore and other South Indian districts; but also in the manufacture of brick tea for Russia, during the recent crisis—an industry which, if once started, might have led to great and rapid developments in regard to one of our most promising customers. The bugbear held up now as ever, is that, if the duty be abolished, inferior China and Java teas will come here to be blended with Ceylon. But can *any* tea imported be inferior to some that is already sold in the Colombo market?—and why should a blending business be relegated to London, America, or the Colonies, if it can be done in Colombo? No one can be so ignorant as to suppose that Ceylon tea will not still continue in Mincing Lane as elsewhere to be bought on its merits, or that any buyer or dealer can be deceived by manipulation or blending in Colombo. The cry for "Pure Ceylon" tea is of very little value in these days when veritable rubbish is sold at Colombo sales. There must now be the guarantee that it is "good" as well as "pure" tea and such guarantee can be as readily given when Colombo is a free port for tea, as at this moment. If the attention of the Viceroy in Council is called to this Ceylon tea duty, its abolition will assuredly be requested more forcibly than politely. Far better on every account, not to wait for such an invitation or request.

A TEA CESS FOR INDIA.

I have read with much interest your articles on a "Tea Cess for India." It is a great satisfaction to us here in South India to find you using your powerful influence with the object of inducing the Indian Tea Association to make a second appeal to the Government of India to place a small compulsory tax on the export of tea. The feeling of my own Association (and I believe it is the same with others in South India, though I cannot speak with authority for those Associations) is, that a compulsory cess should long since have been imposed; that the small contribution hitherto raised in India for the Foreign Market Fund is a blot on the spirit of enterprise and the dignity of the Indian tea planter, and that a tax on the same lines as that raised in Ceylon would not merely be no hardship, but would be refunded to us over and over again by the certain increased consumption of our produce. In addition to this we down here, who are so near Ceylon and are so closely in touch with those in the islands, feel very bitterly, that we are taking a mean advantage of the liberality and public spirit of our brother planters across the water, and with very small cost to ourselves are reaping what they have sown. It is hopeless to expect the Indian Tea Association to move further in this matter, if they are going to wait for a "fair show of unanimity" from the Indian tea planters. That we shall never get. What we want is a good majority. I think you are wrong in stating that by "unanimous consent" the Ceylon "growers placed the matter in the hands of their Government. Was it not because the growers were not unanimous, that an influential majority placed the matter in the hands of their Government? In all communities, particularly in those so large and so varied as that of the tea planters, you will always find a certain proportion, on whom persuasion and argument are thrown away. In such cases the opinions and wishes of the greater and more influential number should be considered. Surely this is a social law? I am glad to see from your issue of the 16th August, that those standing out from the present Fund in Northern India do not amount to more than 35 per cent., and a part of those standing out would (I understand) not disapprove of a compulsory cess. Might not then the minority, which would be still smaller were Southern India added to the poll, be disregarded?

GRANVILLE L. ACWORTH.

Peermaad *via* Periakulam, Sept. 1st, 1900.
—*Indian Gardening and Planting*, Sept. 13.

"THE TALE OF A TUSKER"

is given in *Macmillan's Magazine* for September in a paper signed "A. D. G-G." We make a few quotations. The paper opens:—

Most shooting stories tell of success, of some good bag, or of the gain of a particular head; for a change, here is a tale of defeat. This is the account taken from my journal, of a long day after elephants, a most interesting and exciting day, to which I look back as among the very best of all my sporting time. Then I was a comparative novice at big game. The country was Ceylon, and the month January. For arms, I had a ·450 express, while the big rifle (a ten-bore) was carried by Hena, a Cingalese, who was an indifferent hunter, plucky enough, but quite ignorant of woodcraft. . . . All at once Hena bent and peered into the foliage to the left, where I saw a few leaves gently shaking. "*Alliah* (an elephant)," he whispered, and then clutching my arm in his excitement, "*Eta, eta, eta alliah* (a tusker elephant), and suddenly I saw among the leaves a long and shining tusk. Without the slightest warning we had walked straight up to a tusker. Now in Ceylon tuskers are extremely rare, so rare that few sportsmen ever see one. I can think of half a dozen people who have shot one, but I know nobody who can claim two. It was difficult to make the elephant out in the half-light of the dense cover, but he was not of great size, probably something over eight feet high. He was broadside on, perfectly motionless: and as I loaded and cocked the ten-bore, more noiselessly than I had ever done before, as I crept cautiously towards the animal and paused when he made a quiet pace forward, as I halted within ten yards to wait an opportunity to

fire, confident in my two or three previous triumphs, I never doubted of success. The foliage was so thick about him that I could not see his head distinctly, but his quiet advance, for he took now and then a slow step onwards, promised soon to bring him into a gap near me about a yard broad. Into this, accordingly, I crept and crouched down, six or seven yards from where I thought he would pass. For full five minutes I waited. The elephant was quiet, evidently dozing, but now and then he would swing his trunk against the thin stems on either side, causing a shiver and rustle of their foliage. I could hear the deep rumble of his inside, and the great breaths that once or twice bust up from his lungs; I could see his forefeet distrinctly, but no vital spot. Then he came forward and stopped, the brute, at the very edge of the gap, his brain covered by a thickish sapling, his forehead and trunk in full view. Not daring to stir I waited, for an age as it seemed, noting every wrinkle of the loosely-hanging trunk, every blink of the half-closed eye, every stain and blemish of the tusks; the left one, the nearer, stood two feet beyond the lip and was broken sharply at the end; the other was a foot longer. I do not know how long the animal stood there, but at last round he swung into the gap towards me and as I hurriedly raised the rifle and pulled the trigger he was towering above me barely five yards off. I was too close to him and felt my aim had been too high; his advance had taken me by surprise.

But a two-ounce bullet hits hard and this one knocked the tusker over like a nine pin, as the tremendous crash of branch and sapling plainly told, a torn-off twig hitting my shoulder. The smoke hung very dense, and I did notlike to advance, but a shrill trumpeting and continued crashing showed that the beast was struggling to his feet and when I plucked up courage and went forward, he was on his legs, his feet far apart, his body swaying drunkenly from side to side, his head buried in the branches. Of course I ought now to have fired at his heart, but I was a beginner and did not, trusting to the common rule in Ceylon which bids one fire only at the brain. Already he began to make some staggering sort of way forward. He got back into the gap but never exposed his head; his pace quickened into a run, and then wildly trumpeting, he rushed headlong forward, crashing, smashing, rending, straight through the thick and cumbered forest. My dash in pursuit hindered at every step by the chaos of destruction in his wake, was hopeless; the bushes closed behind his tail and I saw him no more.

Then come five pages of jungle description, in following the elephant, being benighted and in getting back to the hut:—

I have had the luck to know a little of many jungles, and they are all delightful; from the muddy fastnesses of the Sunderbunds and its mysterious waterways arched in with palms, to the glowing autumn pinewoods of the Himalayas; from the vast grass coverts of the Terai to rocky bamboo-clad hills and upland teak-forests, black, burned and leafless in the Central Indian summer. But for Ceylon I keep an extra warm corner in my heart, poor though its trophies mostly are. There first I shot big game; there first I saw the jungle and drank in and made my own its spirit. Sad would I be to think that spirit could ever leave me or that I am never again to follow through the forest some one or other of its greater denizens, and to be there, more truly than it is possible elsewhere, my own master owing allegiance to no man.

CHEAP TEA FOR INDIAN VILLAGES.

I am absolutely ignorant with regard to the tea trade, but I have read a good deal lately about the "booming" of Indian teas, and it seems to me that one opening which might be made use of is neglected, so I venture, very humbly, to point it out. I mean the sale of cheap tea, or tea dust, among the poorer class of natives in agricultural districts. These districts are often malarious, and officials who have to do a good deal of camping find that their servants keep free from fever if supplied with tea while they are out. I happened to live for a short time in a small station in Behar where fever was very prevalent among the natives. My servants considered "a little tea" a remedy for all ills, and the demands on my tea-caddy were so great, that at last I procured a quantity of tea dust at four annas a pound from a garden in Darjeeling, and told my servants that they might have as much of it as they liked at that price, paying the freight mys f. The whole supply, 10 lb., was gone in a day, and I could have got rid of four times the amount for many of my neighbours' servants were anxious to buy it too. The cheapest tea to be had in the station was adulterated tea-dust, sold by the local Whiteley at seven annas a pound! Since then I have always kept a supply of dust for my servants, they appreciate it greatly, and buy it most willingly at 4 annas a pound. Most of them, I believe, drink tea at least once a day, and they declare that it keeps them in good health. Whether this is really so I do not know, but they certainly keep very well, although this place has a bad name for fever, and once when the supply of dust ran out, and it was some time before a fresh lot arrived, so many began to ail that I was obliged to get them some more expensive tea from the nearest station. I believe the native *pesaris*, or druggists, sell a dreadful compound which they *call* tea, and I knew of one enterprising servant, in a particularly malarious district, who buys cheap tea dust, through a relative working on some tea garden, and sells it to the villagers at 8 annas a pound.

Every large village has a *bazaar* once or twice a week, and I have no doubt that cheap tea would find a ready sale on these occasions, or it could be disposed of by employing men to take it round from village to village, like the native pedlars or *soudagars* who sell cloth and other cheap articles.—TEA.—*Indian Gardening and Planting* Sept. 6.

GREEN TEA IN THE NORTH-WEST HIMALAYAS.

In a recent number of *Indian Gardening and Planting*, a correspondent of yours remarked that he was unaware that green tea had ever been extensively manufactured in India. That he is in error as to the above, the following facts will shew. Up to about ten or twelve years ago, the districts of Dehra Dun, Kangra and Kumaon, in the North-West Himalayas, confined their attention solely to green teas, which were all exported at very profitable rates to Kabul and Central Asia. We found the manufacture simple as well as remunerative, as the cost per pound was far less than that of black tea. The qualities preferred were Young Hyson, Hyson, and Gunpowder, all of which had, however, to be entirely free of dust or broken tea, which sold separately at something above cost price. In speaking of my own district, the Dun, I remember the time when Central Asian merchants visited the gardens early in each year, and cheerfully advanced large sums to secure the whole season's crop; and later oo, after the rains, they used to return with their own camels and carts and buy up all the tea, for cash down, that the gardens could produce: in fact the demand generally exceeded the supply. The tea was simply packed in gunny bags, lined with some thin cloth within. Each bag con-

tained about a maund more or less, and the packing cost on an average seven annas per bag. When I mention that the cash price paid at the factory before delivery amounted to anything between As. 12 to R1·4 per lb., it will be realised how profitable the manufacture of green tea was at that time.

But those halcyon days of prosperity came to an untimely end, and in the beginning of the "nineties" this profitable business wholly vanished. Its destruction may be assigned to three causes, viz., first, the prohibitive customs duties levied by the Russian Government in Central Asia; second, the suicidal fiscal policy of the Amir of Kabul; and last, but not least, the apathy, and I may say the pusillanimity, of the Indian Government, in not vigorously supporting the planters of Northern India. Unanimous representations were made by the districts abovementioned, with a view to having these disabilities removed if possible, and a strong deputation waited on Sir James Lyall, the then Lieutenant-Governor of the Punjab. Though we were well received, and given every opportunity of thoroughly explaining the ruinous situation, we could not help feeling disappointed at the official *laissez faire* attitude adopted towards the whole tea industry. And it was apparent to us that the Indian Government had evidently not yet emerged from the destructive thraldom of the "masterly inactivity" school; and as a consequence the unfortunate deputation broke up without having obtained any tangible results from the powers that be. Subsequently I had the honour of a personal interview with the then Viceroy, Lord Lansdowne, who though showing the greatest sympathy with the planting community in its distress, he yet professed his inability to do anything for the industry in the direction desired. It is a noticeable fact that just about that period, both the Kabul and Russian Governments treated the Indian Government as a wholly negligible quantity in politics, and we were far too weak and vacillating in our policy to resent such derogatory treatment, and claim an equitable reciprocity in trade.

Be the cause what it may, once again nothing was done to help the struggling planters in these parts. In despair I offered to proceed to Kabul myself, and personally represent matters to the Amir from the non-official trader's point of view. Fortunately this proposal found favour, and I was accorded permission to accompany Lord Roberts' mission to the Amir. However, the mission, as everybody knows, did not proceed to Kabul, for political reasons, and once more an opportunity was lost of obtaining some redress. As a last resort I applied to be allowed to address His Highness the Amir direct by letter. This request was granted with the proviso that I should first submit my communication to the Government at Simla for approval. The letter was considered satisfactory, and was graciously translated into courtly Persian, and returned to me to forward on to Kabul. That was many years ago, but in spite of proverbial Oriental politeness, His Highness has not to this day had the courtesy to acknowledge a respectful and important petition, concerning the trade interests of so many of his own subjects, as well as those of the Indian Government. Some months after the despatch of my letter, I heard from private sources, that the Amir had declared his firm intention not to be guided in any way by the Indian Government in matters concerning the internal trade of his kingdom; and we were therefore sacrificed to the whim of an unenlightened potentate, and the ineptitude of our own rulers.

The above ends the lamentable history of a once flourishing trade in Northern India. The green tea market having been destroyed through the machinations and neglect of others, we were perforce obliged to turn to the manufacture of black tea, but with nothing like as profitable results. The wisest course now, in my opinion, would be to revert again to green tea, if not altogether, at any rate to a considerable extent; and to make it this time especially for the American consumer. From the fact that the Central Asian, and subsequently the Bombay traders, have pronounced our green teas as very similar to the same qualities from China and Japan, I feel convinced that the hill gardens of Northern India are capable of producing a commodity that would compete on more than favourable terms against China and Japan teas in the American market. But I cannot say I feel very sanguine that any such business-like step will be generally undertaken in these days of official neglect and regrettable drift and disunion among those connected with tea. When planters show so little cohesion and community of interests, and Government show such marked opposition and discouragement to all private enterprise, no decided improvement can logically be expected, in the tea industry of Northern India.—J B Leslie Rogers.

Camp Dunga Gully, *via* Murree, Pujab, Sept. 4.—*Indian Gardening and Planting*, Sept 13.

BRICK TEA FROM LONDON TO RUSSIA: INDIAN TEA AND THE PARIS EXHIBITION.

TEA COMMISSIONERS NOT OF MUCH USE IN NEW COUNTRIES!

(*From a prominent London merchant writing to the Calcutta "Planter."*)

For several years back a large shipment of brick tea in baskets has been sent annually from China to London for re-shipment from there to Siberia through the Kara Sea. This route has proved rather unfortunate and is, I think, now entirely abandoned. One year, tea to the extent of 4,000 tons was on board the P. & O. steamer "Aden" which became a total loss on the island of Socotra. Last year's shipment was despatched in a fleet of 3 or 4 light draft steamers bound for the Yenisei River, one of which was totally wrecked somewhere about the White Sea, and the others being unable to get through had to return to London, where the tea was re-warehoused. It lay in bond here all winter, and sometime last spring it was re-shipped, a statement being made that it was going Overland from Vladivostok. I query the route as the Siberian Railway is so incomplete, and I question whether the tea may ever reach its destination owing to the disturbed conditions in the north of China, but anyhow I am told those who tried to work this service do not intend to re-open it. At present there is litigation involving a very serious amount of money in the London courts, the owners of the tea claiming to be refunded by the steamer people who had made the contract to carry the tea to Siberia, the amount of the cost that it is now entailing upon them for sending it through by the other route.

If you happen to see the London *Grocer* for Saturday 18th Aug. there is a page there on "Tea in the Paris Exhibition" *contributed by me. The *Grocer* has excised certain references to Japan tea which I think it would have been well to print, but they were cutting the article down to the limit of a page. You will see that I have endeavoured to deal fairly with the representation of tea by each of the countries, and that I take a much more favourable view of what the Indian people have done as compared with the others than some of your correspondents have expressed.

Of course the Indian planters lack the energy of the Ceylon man and do not advertise themselves so thoroughly, but all practical tea experts regard

* This article has been already reproduced in the *Tropical Agriculturist*.—Ed. T.A.

Indian tea as a much more satisfactory article than Ceylon tea and appreciate it accordingly, as you can see from the higher price which they have to pay for it. I think a great deal of nonsense is being talked and written about producing green teas and about the lack of missionaries to open up foreign markets. The ordinary trader is a much better missionary than any special commissioner, and I do not think the latter have ever achieved much wherever they have gone. They have simply upset the ordinary distributive methods, which to my mind work in almost an automatic manner, blenders making use as they go along of the tea from which they can get the best value. This is how Indian and Ceylon teas have made progress gradually in all black-tea-drinking countries, merely displacing China tea, but it is a totally different thing to displace green.

Please note that I have not written this for publication over my own name, but you can make what use you like of the statements I give you, and I will accept responsibility for any of them.

TEA IN TRIPOLI.

Tripolitania.—Tea is now supplied by England in very large quantities, most of which are re-exported to the interior of Africa. Formerly several Hamburg firms used to sell tea here also, but for some years past they have had to withdraw from the market as they could not compete with English prices and conditions. The most current qualities are green teas ranging in price from 1.90 frs. to 2.20 frs, per kilo. c.a.f. Tripoli.—*M. Ernest Labi, Belgian Consul at Tripoli.—British Trade Journal*, Sept. 1st.

PLANTING NOTES.

MANGANESE MINING IN CENTRAL INDIA.—A Syndicate, with extensive Manganese ore rights, has, it is stated, approached the Bengal Nagpur Railway Company with a proposal for the connection of their workings by a 2ft. 6in. gauge mineral siding to the Tharsa station, a distance of ten miles. In addition to the ore traffic, the proposed branch would serve the large pilgrim traffic to Ramtek in the Central Provinces.—*Pioneer*, Sept. 15.

THE PASSION FRUIT.—A London horticultural journal states that shipments of passion fruit packed in the shredded bark of the tea tree have arrived in London in an excellent state of preservation. The same organ refers to the great possibilities there are in shipping dried fruits from Australia, not only to England, but to other parts of the world. The dried fruits of Mildura have made a good impression, and demonstrated the possibility of a profitable trade being carried on, provided all the primary conditions of careful curing and packing are scrupulously and undeviatingly fulfilled.—*Indian Gardening and Planting*, Sept. 6.

GAS LIME.—The usefulness of gas lime for land is becoming better known every year, and the proper time to apply it is directly the corn crops are carted home. But it must not, says a contemporary, be put on "seed" fields, because if applied fresh and in quantity, it kills all vegetable life. Albeit when it has lost its sulphur which it does in a few months, it is no longer injurious to plant life, but succors it, and acts as a potent fertiliser. It acts most usefully when fresh in killing all kinds of creature pests in the soil, which are very destructive to crops in many fields. Tipula grubs, slugs, and wire-worms are the worst pests, but gas lime kills them when applied properly—that is, in sufficient quantity and quite fresh.—*Journal of Horticulture.*

EGG-PRESERVING IN WESTRALIA.—The Department of Agriculture intends to have a thorough test made of the various modes of preserving eggs, and for this purpose a large stock of eggs will be obtained and treated with different preparations at the Government refrigerating works. The eggs will not be tested until the next Producers' Conference.—*Westralian paper*, Sept. 5.

FLOWER FARMING IN THE UNITED STATES.—There were in the United States last year no fewer than 9,000 farms on which flowers for cutting were grown under glass for sale, the total areas actually under glass aggregating 22,500,000 square feet. The Department of Agriculture at Washington estimates that the retail value of the cut flowers sold from these flower farms annually is no less than £2,500,000 apportioned as follows:—

	Number of cut flowers	Value per 100	Total value £
Roses ...	100,000,000	24s	1,200,000
Carnations ..	100,000,000	16s	800,000
Violets ..	75,000,000	4s	150,000
Chrysanthemums	———	——	100,000
Miscellaneous flowers, Lilies, &c.	———	——	250,000
Total ...			£2,500,000

In addition to this it is further estimated that the retail value of the plants sold from these flower farms is £2,000,000, and the number about 100,000,000. The total retail value of the annual output is thus £4,500,000 or just 4s for each square foot of glass. On the average one man is required for every 1,500 feet of glass, making 15,000 employed in the industry in all. The State of New York comes first in connection with this industry, having 4,500,000 square feet of glass; Illinois is second with 4,250,0 0 square feet; and Pennsylvania third, with 4,000,000 square feet. The amount of capital invested in the industry over the entire country is over £2,250,000 and it is estimated that this sum is actually received by the growers each year for the plants and flowers sold.—*Journal of Horticulture.*

THE CONSOLIDATED TEA AND LANDS COY., LD., has a good deal of tea and coconuts in Ceylon, and in every sense the proceedings at the annual meeting is of local interest. Sir John Muir's speech deserves attention: he strongly condemns the Indian Government for its "rupee" policy and rightly enough shows the advantage gained by China and Japan; but to be quite frank Sir John should have added that the higher rupee put an end to his own policy of further large planting extensions, and that this stoppage was greatly to the benefit of the tea industry, generally. It appears that the Directors and Agents are to always make up any balance required for a 7 per cent dividend out of their fees and commissions. This time they give up half, showing that the total fixed for Directors and Agents in Calcutta, Colombo and London is under £7,000 per annum or the equivalent of about 5s per planted acre. Sir John rightly takes credit for the Company's holding and further planting of cinchona in Southern India—and why not in Ceylon, as well as coconuts? Altogether this Company is a very large and important one and it will be seen that it tries to push Indian and Ceylon teas in America on its own account.

EILA TEA COMPANY OF CEYLON, LD.

REPORT

The Directors submit their Report and Accounts for the year ending 30th June, 1900.

The crop on Eila Estate was 256,403 lb (exclusive of 21,335 lb made from bought leaf) against an estimate of 241,000 lb, and on Kanangama 106,570 lb against 150,000 lb estimated.

The total amount of tea manufactured was 384,313 lb and the cost of production, including the purchase of 85,320 lb of green tea leaf was 22·76 cts. per lb.

The average price of tea after estimating the value of that unsold was 30·38 cts. per lb as against 33·11 cts. for last season.

During the year a further instalment £500 was repaid to the Standard Life Assurance Company on account of their Loan of £7,000

The Directors regret that while there is an increased profit this season from Eila, the young clearings on which estate are now coming on well and give good promise for the future, there has been little or no profit from Kanangama; this is due partly to the drought in the earlier months of this year which reduced the yield for the season and partly to bad management by the Superintendent, and the Directors have reluctantly been compelled to make new arrangements for the working of the estate.

The net profit for the past season after writing off depreciation on buildings and machinery is	R12,468·84
to which must be added the balance from last season	2,907 49
making in all	R15,376·33
Out of this the Directors propose to pay a dividend of 5 per cent absorbing	R15,000·00
and to carry forward	376·33
	R15,376·33

The estimate for the current season provides for a crop of 416,500 lb. Tea at a cost of R90,680·45.

The estates of the Company at this date consist of:—

Eila—564 acres Tea 5 years old.
62 " " 4 "
90 " " 3 "
240 " Forest.
956 Acres.

Kanangama—215 acres Tea 5 years old and upwards.
108 " China and Patna.
323 Acres.

During the year Mr. Stanley Bois was elected to the Board of Directors in place of Mr. Percy Bois, who has left the Island.

Mr. F W Bois retires in accordance with the articles of Association, but being eligible offers himself for re-election.

The shareholders will have to appoint an Auditor for season 1900—1901.

PUTUPULA TEA ESTATE CO., LTD.

REPORT.

ACREAGE.

Tea in full bearing ..	421	
Do partial ..	33	
Do two years old and under	7	
		461
Do Coffee and Para Rubber		21
Forest, Grass, Wasteland &c.		217
		699

The Directors beg to submit to the Shareholders the accounts for the year ended 30th June, 1900.

The crops secured amounted to 182,749 lb. of made Tea against an estimate of 185,000 lb. or 12,449 lb. in excess of last season's crop.

The nett average price realized was 33·09 cents per lb., costing to produce 24·58 cents f.o.b., including the purchase and application of manure to 180 acres costing R6,248·21. The cost per lb. on manuring was 3·42 cents.

The yield works out a little over 400 lb. per acre calculated on all but 7 acres of Tea under two years old.

The clearing and planting of 11 acres with Para Rubber was carried out costing R318·04. This expenditure, it is expected, can be reimbursed by the sale of Para seeds and plants, 20,000 of the latter now being in nurseries.

During the past season the withering accommodation has been extended by raising the roof of the Factory and adding another storey, the extra space thus acquired, measuring about 33,300 sq. ft., will be of great assistance in coping with the increased yield resulting from manuring operations. The total cost, R5,972·32, which includes the erection of a new weighing platform and stair case, is being carried forward and will be charged in the present season's working account under capital expenditure.

The yield for the present season is estimated at 190,000 lb. at an outlay of R45,713, which includes the treatment of 140 acres with artificial manure to cost about R5,460. The profit for the year amounts to R12,713·50 which the Directors recommend should be applied as follows:—

6 per cent Dividend ..	R12,000·00
Bonus to Superintendent ..	500·00
Balance carried forward ..	213·50
	R12,713·50

In terms of the Articles of Association Mr. W. B. Kingsbury retires from the Board of Directors, and being eligible, offers himself for re-election.

The appointment of an Auditor for the current year rests with the Meeting.

PLANTING ON THE ANNAMALAIS, S. INDIA.

Coffee—Tea—Cardamoms.

We are pleased to see Mr. E. J. Martin, formerly of the Kelani Valley, looking so well after his spell of hard work in opening land and pioneering on the Annamalais. If Sir Arthur Havelock has done nothing else for the Madras Presidency, during his five years of administration, he has at least developed a new and promising Planting District in the Presidency and induced several reliable Ceylon planters to bring their capital and experience to the Annamalais. Altogether some 20,000 to 25,000 acres of forest-land have been taken up, and out of this, as much as 3,500 acres, Mr. Martin estimates, have been opened and planted with coffee, cardamoms and tea. Sir John Muir (or one of his Companies) has 6,000 acres and has opened chiefly in coffee and cardamoms. Mr. O. A. Bannatine, formerly of Maskeliya, is one of four partners who have taken up 2,500 acres and he has opened some hundreds. Mr. Martin himself has 1,500 acres with 400 opened—300 or so in tea and 100 in cardamoms. The latter product may be said to be indigenous and a good deal of income has been made last year from gathering cardamoms in the jungle. Mr. Martin speaks well of the labour supply, though not many workers can be got, during crop time in the ricefields in the lowcountry. As for transport, Coimbatore is 45 miles off; but another station 20 miles nearer will soon have the railway, and Governor Havelock, true to his promise, is giving the district a

cart-road right into the estates, the trace being now cut through Mr. Martin's property. This for a district only three years old is exceedingly good and the Annamalai planters altogether will have cause to regret the retirement of Sir Arthur Havelock who has taken a warm personal interest in their advancement,—an advancement, however, which brings benefit to the whole community.

All the products grown look very promising. Mr. Martin's elevation is about 3,500 feet with magnificent outlooks to the Travancore Hills. The climate is hotter than in Ceylon at the same altitude and the rainfall (which is much above the average this year) though plentiful, is not well distributed, rendering some months about April rather unhealthy. Nevertheless, we could only congratulate Mr. Martin on looking so "fit" after his hard work as pioneer, and we added that he ought to have had a dozen or score of paying "creepers" to benefit by what can so rarely be got now, real jungle work in clearing and planting, away from railways and roads with few or no luxuries. Such an experience it is that makes the contented planter—contented when eventually he sees all in order, and the cart-road within hailing distance. We may add that the terms for these Annamalai lands are 50 cents a year per acre rent and one rupee on land planted and in bearing, the lease being for 30 years with the privilege of renewal for another 30 years on the same terms. The Madras Government do not intend to give out any more land beyond the 25,000 acres; but there are some blocks which were taken up by Ceylon men who have never touched them. These we suppose, or rather their leases, are probably available for sale or transfer, if the claims have not expired. Meantime we congratulate Messrs. Martin and Bannatine and other Ceylon friends on their good prospects and trust they may have the due reward of their labour.

TEA IN SOUTH CAROLINA, UNITED STATES.

We are indebted to several home correspondents for cuttings from the London *Times* and other papers respecting tea-growing in Carolina, as if it were an important matter to us in Ceylon. But with labour at a dollar a day, no tea industry can ever grow to much in the Southern States.

Plantation Doctors in California.—In the long ago there were doctors for the "coloured pussons" held in bondage on Southern plantations; now it is the plants cultivated that are treated by doctors—or their equivalent; for we find, according to the report of the Californian State Board of Horticulture, that inspectors are required to make plants of-infected orchards, showing the exact locatiod of each infested tree; and as a result of the careful work of the inspectors, great success has attended their efforts. Twenty-eight orchards in Riverside County, which in 1897 had a total infection of 1609 trees, had in 1899 only 433, a reduction of over 73 per cent.—*Gardeners' Chronicle*, Sept. 8.

BRITISH ASSOCIATION AT BRADFORD.

BOTANICAL SECTION.

Mr. J Parkins read a paper on "Fungi found in Ceylon growing upon Scale-Insects."

GERMAN EAST AFRICA: PROGRESS IN DEVELOPMENT.

The Foreign Office has just issued encyclopædia report by Mr. Vice-Consul Dundas on German East Africa from 1892 to 1899. It opens with a description of the boundaries, position, and size of the territory, its lakes, rivers, climates, history from the most ancient times, population, administration, public health (including the hospital accommodation), posts and telegraphs, agriculture, industry, lighthouses, shipping, roads, transport, imports and exports, schools, troops, the military expeditions, the various divisions, with details as to the condition of each, and much other information of a similar kind. Under the head of population, some remarks occur on the two classes of Bantu tribes, known as the elder and the younger, which should prove of interest to ethnologists. The imports and exports increase year by year, and in 1898 amounted to £581,013 for imports and £212,399 for exports. Cotton goods amount to nearly half the imports, foodstuffs and other provisions coming next in importance; while the main exports are ivory, rubber, copra, copal, sesame, and coffee. The export of ivory, however, appears to be decreasing, as Congo ivory now goes by the West Coast, while that from Uganda is exported by Mombasa. Zanzibar has a preponderating share in both the import and export trade. On the whole, Mr. Dundas says that the general impression left on the traveller in the region is that the German Government has thrown its heart into the thorough development of East Africa. "No stone has been left unturned, no opportunity missed, to make the most of everything to be found in the territory, which undoubtedly possesses many natural and rich resources. The Government loses no time in ascertaining the natural wealth of the country, and no money is spared in making experiments. The planter and farmer are not behindhand in their endeavours, and are content to spend their money freely in hopes of getting a large return later on. Some have obtained very reasonable results. The British trader does not appear to have thought it worth his while to try his fortune in this the largest of German colonies. The cause is probably not far to seek. He no doubt would not be satisfied to have small results at first, and therefore seeks out some other place. He also expects to have everything his own way. His prospectuses, price lists, inquiries must all be in his mother tongue, regardless of the fact that those to whom he sends them are foreigners, and perhaps not conversant with the English language. The largest foreign community is, of course, the Indian. They appear to be in a flourishing state, although complaints are made as regards taxation. This grievance is in reality quite unfounded. Zanzibar and Mombasa, both so close at hand, spoil the Indian and native as regards taxation. They fail to understand the difference which must necessarily prevail here regarding taxation, and they cannot discriminate between rates and taxes. The East Indian traders must bear in mind that, though somewhat more heavily taxed than in India, they make more than in India. Moreover, the want of knowledge of the German language and Govern-

ment system is a great disadvantage to them. They have been too prone to expect the same conditions of life under German rule that they were accustomed to in India and Zanzibar."—London *Times*, Aug. 27.

SIR JOHN LAWES AND SCIENTIFIC AGRICULTURE:

THE FIRST EXPERIMENTAL STATION AND RESULTS.

In 1842 a patent taken out for treating mineral phosphates with sulphuric acid marked the beginning of the manufacture of artificial manures, an industry which has since attained enormous dimensions. In 1843 a young chemist, Dr, (now Sir) J Henry Gilbert, a former pupil of Liebig, became associated with Mr. Lawes, and the foundation of the Rothamsted Agricultural Experiment Station dates from that year. With the exception of the station founded by Boussingault at Bechelbronn in Alsace, the Rothamsted station is older than any other, for the earliest German station (Möckern) was not founded till 1852, whilst the first of the American stations (Middletown, Connecticut) dates only from 1875.

The plot upon which wheat has been continuously grown, year after year, for more than 50 years without manure of any kind, the land merely being kept free from weeds, is in the highest degree remarkable, for it has given over the whole period an average yield of between 13 and 14 bushels o dressed grain per acre, which is more than the an nual average yield of the crop as grown in the United States and several other leading wheat countries. The manurial experiments upon the mixed herbage of permanent meadow, carried out over a long series of years, have yielded results of the highest practical value, and in particular they have shown what a dominant factor is the character of the season in determining the size and the quality of the crop. The field experiments in general have demonstrated how essential are nitrogenous manures for cereal crops, potash manures for leguminous crops and phosphate manures for turnips and swedes. The relative values of sulphate of ammonia and nitrate of soda as sources of nitrogen, the composition of rain and drainage waters, he utilization of town sewage, and the manufacture of silage are other lines of inquiry which in turn received attention. The publication in 1861 of the classical memoir on the sources of the nitrogen of vegetation marked an epoch in the history of plant physiology. The question as to whether plants assimilate free or uncombined nitrogen was answered unreservedly in the negative, and for more than a quarter of a century this was regarded as a cardinal doctrine, if so it may be termed, of physio logical faith. But, as our knowledge of micro-organisms advanced, the position taken up with so much confidence had to be reviewed, and in 1891 it was admitted, in a Rothamsted paper dealing with the sources of the nitrogen of our leguminous crops, that considerable fixation of free nitrogen may—and does—take place. In his brochure on "Fertility," published in 1881, Sir John Lawes stereotyped the views which he had enunciated 20 years previously, and thereby added much to the difficulty of modifying his opinions at a subsequent date. The 70 pages of this masterly pamphlet all pointed to one conclusion—that the soil is a mine and not a laboratory. The author wrote:—"If the evidence of the Rothamsted experiments up to the present time has not established beyond all cavil that practically the source of the whole of the nitrogen in our crops is the store within the soil itself, and the nitrogenous manures brought upon it, there can be little doubt that in the course of their future progress they will afford conclusive evidence on this point." Nevertheless, ten years subsequent to the publication of these words conclusive evidence came from Rothamsted itself which pointed in quite the opposite direction. It is a matter of regret that if Sir John Lawes did not find an opportunity of rewriting his essay on "Fertility" in the light of the fuller knowledge since attained of the micro-organisms of the soil.—London *Times* Sept. 1.

THE ACME TEA CHEST.

A planter having complained of the weight of the tea chest on inspection in our office, we are able to give the following information:—"About 17 lb. are the tares of the acme veneers complete against say 26 lb. for momies including hoops, lead, nails, etc. If your planting friend refers to gross weights then: A size of chest when filled with Sonchongs, Pekoe Souchongs, or Pekoes comes in well under the 129 lb. limit of London warehouses, and B size (smaller) suits, in the same way, for B.P., etc."

PLANTING NOTES.

THE COFFEE CROP in Nicaragua for this season is estimated, by both Government and planters, at fully 150,000 bags, as against 75,000 bags for the last season; the export duty on which will amount to 300,000 pesos, or sufficient to pay the interest on the foreign debt of $1,400,000 and leave a handsome surplus of $40,000 or $50,000 gold.—*British Trade Journal.*

THE NYASSALAND Agri-Horticultural Society's Committee held a meeting on Thursday evening when they made some important changes in the published list of classes to which they wish attention drawn. Also to the additional notice at the end of the advertisement. Next week the prize list, which is a very good one (over £130) will be published in full.—*Central African Times,* August 18.

BASIC SLAG ON CLAY SOILS.—A writer in a weekly contemporary praises in generous terms the beneficial effects of basic slag on the stiff weald clays of Sussex. The use of this phosphatic manure on the Uckfield College and neighbouring pastures has been productive of extraordinary results, grass land that a few years ago was scarcely deserving of the name having been rendered productive and fertile by the prudent application of this substance. The basic slag answered well alone, but it was most effectual when employed with sulphate of ammonia, the weight of yield being increased by the addition of two cwt per acre of nitrogenous dressing, while the quality of the herbage was of a better order than when nitrate of soda was the accompanying substance. The writer relates a striking instance of an incredible farmer in proximity to the college being brought a convert to the virtues of basic slag through practical demonstration of its effects. After much persuasion he was induced to dress part of a grass field with the manure, and so clear and tangible was the result that he is now an extensive user and a strong advocate of the material. For clay soils there seems to be no more serviceable artificial manure than basic slag.—*Journal of Horticulture and Cottage Gardener,* Sept. 6.

Pruning oftentimes is entered upon with the impartiality of Mrs. Squeers, when that estimable being dispensed her brimstone and treacle, "if they didn't need it then, they might at some other time." No pruning at all would be better in the end than this, but it would be vastly better than either, were trees properly pruned at planting, and yearly cared for to keep them in the right way.—*Queensland Country Life*, Aug. 23.

The Parsley-leaved Bramble.—Any time from the end of October onwards to March is suitable for planting this useful Bramble, provided the weather be suitable for the operation. Perhaps early in November is as good a time as any. It is done the same as planting Raspberries. Fertile yet rather porous soil is best, as the plants do not become established quickly in cold heavy land. This Bramble is good for covering walls or fences,or it may betrained in the form of arches over walks, or in any other convenient manner desired. When it commences bearing all that is necessary is to cut the portions out and retain the best of the young growths, is in growing Raspberries.—F.—*Journal of Hotriculture and Cottage Gardener*, Sept. 6.

How Water Ascends in Plants.—At one time there was oonsiderable difference of opinion as to the course pursued by the sap of trees in ascending from the roots, and that followed by the food materials elaborated in the leaves when being transferred to the various portions of the tree in which their process of growth was in progress. It has now been established that all the moisture required by the tree or plant for its existence and growth is taken up by the roots, and that the water so absorbed is conveyed to the higher regions through the medium of the woody part of the stem. On the other hand the food material elaborated by the leaves are conveyed to the various parts of the plant system by the bast tissues which immediately underlie the bark, and are ranged around the outside of the wood.—*Journal of Horticulture.*

Trade of British New Guinea.—The annual report of British New Guinea for the year ending June 30th, 1899, shows that the exports of indiarubber for that year were £1,935, against £3,683 in the previous year. Of sandalwood £2,920 worth were exported, a decrease of £20 on the previous year. The report goes on to say that the decrease in indiarubber is probably partly due to the most accessible country near the coast having been more or less worked out. At present, also, it is next to impossible to prevent the destruction of the trees in new country. Apparently the export of sandalwood may increase during the coming year, as the price has risen. The industry is now carried on in a more systematic fashion than it used to be.—*British and Colonial Druggist*, Aug. 24.

Sir John Lawes, says the London *Times*—was one of the greatest benefactors of agriculture—perhaps the greatest—the world has seen. His originality in experimental research and his inflexibility of purpose, coupled with a genius of no ordinary kind, enabled him to discover grand truths which have had a profound influence upon the progress of agriculture. Happily, through the munificence of their founder, the Rothamsted experiments do not cease at his death. By a trust deed, executed in 1889, Sir John Lawes set apart a sum of £100,000, together with the laboratory and certain areas of land, for the prosecution of the investigations in perpetuity. The unique feature of the work at Rothamsted—its long unbroken continuity—will thus be characteristic of it in an ever-increasing degree.

Various Essences and Perfumes can be obtained, says the last annual report of the Government of Cyprus, from the aromatic herbs growing in the State forests, and experiments are being made to ascertain whether they can be produced on a commercial scale to yield a fair profit. There is a small Government garden at Nicosia from which plants are distributed so far as means will allow; but there are no botanical stations.—*B. and C. Druggist*, Aug 24.

Planting in Nyassaland.—Our correspondent, Mr. Henry Brown, formerly of Matale and Dimbula, fairly takes our breath away by his enumeration of all the good things to be enjoyed, and produced, in his adopted land; and yet who ever heard of any one making money in Nyassaland—and can Mr. Brown tell us of half-a dozen men who have stood and enjoyed the climate as long as he has himself with his exceptionally strong constitution? It is, however, extremely interesting to read about the growth of so many old and new products—chillies and fruit among the rest.

Ceylon Tea in New Zealand.—We direct attention to a letter on another page from Mr. G T K Mackenzie of Dunedin, who has taken a leading part in pushing the sale of pure Ceylon tea in New Zealand. It will be observed that he complains of a move on the part of certain local dealers to get an import tax placed on packet teas imported from Ceylon and yet the same agitators are so inconsistent as to say that such Ceylon packets are far inferior to their own, inasmuch as our "coolie" labourers who pack, cannot be depended on for cleanliness. Now Mr B.—or who ever he is who urges this argument - shows the crassest ignorance of Ceylon conditions, inasmuch as every factory and store manager here is most particular about all the workers in tea,—whether firing, sorting or packing—being specially tidy and clean. If the New Zealand authorities are so ill-advised as to tax our packets of pure tea, it will be to the distinct disadvantage of their own people, and moreover it may lead to a disagreeable reprisal one of these days.

Dearer Quinine.—By the last advance of cinchona bark at the Amsterdam auctions, which nowadays are the means through which the world obtains almost the whole of its quinine, the price of bark has reached the highest point touched in recent years, ever since, in fact, Holland and Java became what they are. Quinine has advanced in consequence though it has not yet reached the price to which it attained last year. This is mainly due to the fact that specnlators are not so weak and "heady" a body as they were twelve months ago The "small" men got severely bitten in many cases then, and have left the article alone since. The result has been beneficial to the quinine market, which today occupies a sounder position. It is, as we show in an editorial note, a cause for congratulation that, after six months of consistent high prices, quinine is cheaper than it was after one sudden leap on the part of bark to a less height than it now occupies. Another healthy sign is that the London stocks of quinine have been reduced during the last two months after a long period of increase. Speculators are still commendably cautious, and makers, though eager buyers of barks at the high rates, keep their price of quinine in clos e tonch with that of cinchona. The outlook is thus very promising, especially as the autumn demand is near at hand.—*B. & C. Druggist*, Aug. 31.

TEA AND THIBET: "GREEN" *vs.* BRICK TEA.

In the absence of any practical experiment it is, of course, impossible to say how great a measure of success would attend an attempt to create a demand for Indian tea in Thibet, but it should most certainly be made. Although the proposal to manufacture green tea for the American market has fallen rather flat with Assam and Bengal planters, a proposal to manufacture brick tea would probably meet with some response. The tea refuse, etc., which Messrs. Barlow & Co. offer to dispose of, would not in any way affect brick tea manufacture, as the latter would be made from prunings, etc. It would, of course, take some time for the commodity to establish a market for itself, and for it to do so at all would doubtless prove a matter of much difficulty, but as the tea would be manufactured from material, which at present is not utilised at all, planters in Assam and Bengal would find it to their advantage to make it. Mr. A Dalgleish pointed out in 1881 that the Thibetan market was "capable of taking all the surplus tea for which, in the home market, there is no demand," and, further stated that it was one which "we can supply without increase of production, and at the same time without withdrawing a single pound of the tea which can find a sale in the London market." There were at the time opponents to the scheme propounded by Mr. Dalgleish, who thought it better to look for a market to America and the English Colonies rather than to Thibet, but this, we think, was due to a misapprehension of Mr. Dalgleish's plans. The trade in brick tea with Thibet would not be in preference to, but in addition to, extension in other directions. The Thibet market and the others are entirely distinct, and the kind of tea required for the former is an altogether different article to that required by the home and foreign markets, and would not in any way interfere with our export trade with other countries.—*Indian Planters' Gazette*, Sept. 15.

CHEAP BANANAS:

EFFECT OF THE NEW WEST INDIAN MAIL SERVICE.

Bristol is to be the port. and London the chief market for the new West Indian service, which Messrs. Elder, Dempster and Company are inaugurating immediately after Christmas next. The new service is to carry mails and merchandise as well as passengers. It is to help the West Indies to forget the iniquities of a foreign sugar bounty system, and it is to place West Indian fruits and other products on the English markets to an extent never before attempted. The start with, the English consumer will be invited, on tempting terms, to dispose of 500 tons of bananas a fortnight.

Steamers will arrive at Avonmouth and discharge direct on to the railway alongside. Two hours later the boat trains will be at Paddington, or, if needs be, Midland trains can be loaded by the waterside and sent without loss of time to the heart of England. The Bristol Dock authorities have been bestirring themselves to cope with the new traffic. Along the Avonmouth quayside a passenger station and fruit store are to be provided, as well as other necessary accommodation, at a cost of £16,0ÇO. The Bristol Chamber of Commerce has established a West Indian section, and the section is sending out a Commissioner who is going to arrange forthwith for an exhibition in Jamaica or Bristol manufactures.

It is under a ten years' contract with the Crown Agents for the Colonies that Elder, Dampster and Co. are establishing the new service, the Government paying a yearly subsidy of £40,000. For the first three years the steamers employed must have a carrying capacity of not less than 3,000 tons, accommodation for fifty-five passengers, and be capable of a speed of 15 knots an hour; and another stipulation is that every boat shall bring over 20,000 bunches of bananas (equal to 500 tons.) After three years have elapsed boats capable of carrying 5,000 tons cargo and 150 passengers will be placed on the service.

The first steamer dispatched from Bristol will be the "Port Royal," which will leave on Jan. 16th She is one of four steamers being specially constructed for the line, and has accommodation for one hundred first-class passengers, fifty second-class passengers and 5,000 tons cargo. It is reckoned that she will do the trip to Jamaica in eleven or twelve days, and it is likely that Mr. and Mrs. Chamberlain will be amongst the party travelling by her in January. At all events they have expressed a wish to be with the first passengers by the new service. The service to Jamaica will be fortnightly to begin with; later it may be weekly; and one of its special features will be low fares to boys and girls sent from the West Indies for education in England.

The large quantities of fruit that each steamer will bring to England will be conveyed in holds specially adapted. In each hold the temperature will be kept uniformly low. Bananas will be ranged in rows or "streets," and all that science and experience can suggest to achieve the best results will be done. Experts have already left for the West Indies to make arrangements for the collection and shipment of fruit, and an expenditure of £30,000 will be incurred on account of cooling machinery. It is evident that in Jamaica big things are expected of the new service, for the report is that already land there has gone up ten per cent in value.—*Daily Chronicle*, Aug, 31.

SCIENCE AND TEA PLANTING

In your issue of 19th July, page 45, Mr. Stebbing asks me how I propose to carry out the natural desire to make tea "pay." He refers to my letter in yours of 28th June and in that I said that what we want to know is how to make an unprofitable garden pay and how to improve the tea of that garden and the way to do so is to get such a garden and improve it.

I contend that an experimental garden would be of greater value than a scientist. Of course if the scientist could be employed *on* that garden it would become of greater value.

Mr. Stebbing says that my views are not shared by the bulk of planters, but I note (in yours of 16th August, page 110) that Mr. H. J. Lawrie, in his speech, has almost repeated what I said about Mr. Bamber and the value of another scientific investigator. If Mr. Mann could be placed in charge of a tea garden, with an experienced assistant to teach him the rudiments of tea planting, there is no doubt that he would do great things. He would then investigate tea pests, and the question of "fermentation" from their proper base, *i.e.*, in regard to "profit."

He could try all the proposed remedies for pests, and he could try all the latest discoveries in tea-making, such as red lights for the colouring room, or the refrigerating process. I see that Mr. Stebbing agrees generally with the proposal for an experimental garden, and I fancy that he imagines that I am running down the scientific officer himself. I do not doubt that Mr. Bamber, for instance, did *some* good for tea planting, but he made no discoveries, and has done little more than compile an encyclopœdia of existing knowledge, and in my opinion Mr Mann will accomplish no more unless he is fixed to one place and investigates improvements which are practicable and profitable. Supposing that the garden he takes over has been making 6-anna tea for the last five years and a yield of four maunds per acre ; he will try all sorts of manures, giving their costs and the results in increased yield ; and he would try various methods of manufacture, and keep records of results. He might, if he pleased, analyse the soil before manuring and tell us that he returned so much per acre of what was wanting, but that information alone, without the facts as to increased yield and cost of manuring, would be of no interest or use to tea planters. The decadence of every moribund tea estate can be placed to the faults of the proprietors. As a rule, they grudge funds for absolute necessities ; they imagine that money cut off from the expenditure means so much more profit. What we want is an experimental garden which will show the proprietors that a certain course of action ought to result in a certain profit, and they will *then* find money for the necessary improvements.

A large number of estates pay handsomely, and it may be asked why these should subscribe to show the way to their less fortunate brethren. There is nothing more certain than that tea planting is a progressive industry. Every manager should look ahead. He should find out what he should do if his tea goes down one or two annas per pound. I would not mind betting that within six years Assam tea will go down two annas per pound, and that the tea of other districts will remain at the present figure. How many Assam planters reckon on a loss of two annas per pound? If this does happen they *must* make more tea per acre and the experimental garden will show them how to do it. The decadence of Assam averages is hardly a part of the heading of this letter, but as I have mentioned it I may as well give my reasons. Assam tea prices are not given for their value for drinking, but only because of their ability to bolster up weaker teas. Every improvement in the weaker teas will thus decrease the value of the "strengthening" Assams. The weaker teas will have to improve to keep their present prices, and they *will* improve; each year sees improved machinery and process. Whatever happens, even the best estate *must* look ahead and be prepared to increase its yield if necessary; the necessary knowledge can be acquired and stored up by the experimental garden. I would bar all catch crops, we want to know how to make "*tea*" pay. Universal improvement will not reduce the value of our teas, in fact, it is only by steady and marked improvement in the quality of our tea *as a whole* that we shall be able to extend our markets and oust the Mongolians Mr. Lawrie said that every pice that we can spare should be used in opening out new markets, but improved quality of tea will be a great factor in doing so. Is it too late to have both the scientific officer *and* the experimental garden? The cheapest way would be to lease a garden which does not pay, for a period of five years; the same could be done five years hence in another district.

The great difficulty in experiments is keeping accurate records, and a scientific man would of course have been trained to keep records.

I should imagine that some of the larger companies would be glad to lease out say 200 acres of their worst tea, and allow the scientist to investigate the manufacture of their teas. The vendors of manures would give their goods free of cost as an advertisement. New tea machinery would also be given free of cost till proved of value.

I agree with Mr. Stebbing as to the possibilities of catch crops, but they must be kept severely apart from tea science. Catch crops will only enable bad gardens to hang on longer, and swamp our market for the sake of a small profit from other crops.—A.C.—*Indian Gardening and Planting.*

PLANTING NOTES.

Orchid Fibre.—Orchids are famous for beauty and general attractiveness, but it is not generally known that they have a place in the arts that ministers to the physical wants of man. But in some parts of the tropics, where Orchids abound, a very delicate fibre is prepared by the natives which they use in the preparation of the many ornaments these races prepare for trade with he paler races of men.—*Journal of Horticulture.*

Phenomenal Sale of African Mahogany.—On the 24th ult., at the auction sale of Messrs. Edward Chaloner & Co., at Liverpool, two logs of African mahogany were sold for the unprecedented amount of 1,530*l*. These logs formed one tree, and were bought for the purpose of being cut into veneers for the decoration of the palatial residences of some of the merchant princes of the United States of America. The veneers are used in the place of wall paper, and, being beautifully figured, give a superb effect. The prices realized for the two logs were respectively 10s 3d and 7s 3d per superficial foot, which is a record for African mahogany logs in the rough state, as imported.—*British Trade Journal*, Sept. 1.

The Glut of Fruit.—With the present enormous fruit crop, especially Plums and Damsons, it is devoutly to be hoped that means are being taken to preserve it whole, or as jam, so that the cultivators will not be losers by the bounty of Providence. Such bulky goods at the present onerous freight rates charged by the railways often cost more in transit charges than they sell for, but preserved on the spot, or in the vicinity of the fruit orchards, their bulk is considerably reduced and their distribution as preserves made lighter and much less costly. We hear this year of Cherries and Plums left to rot on the ground, and it will doubtless happen that much of the Damson crop will be a loss to the growers because of low price and high railway rates, unless something be forthwith undertaken to turn the fruit into a marketable commodity.—*Gardeners' Chronicle*, Sept. 8.

A Substitute for Turf on Lawns.—In *Die Gartenwelt* for August 25 last, we remarked that a correspondent recommends as a substitute for grass in dry places under trees, and in any place where grass does not succeed, or mowing is not desirable, Veronica repens (erroneously called V. alpina). V. repens is but little known in gardens, but it is a plant worthy of being highly recommended. The plants form a regular, green, fresh-looking carpet, and possesses the desirable attribute of not suffering in unfavourable weather. The plant is covered in the spring with innumerable whitish flowers, so that the lawn looks then as if covered with fresh-fallen snow. The plant is propagated by division after the flowering is over in April, much in the same manner as Violets and Chamomile are treated, and the plantlets set out at 6 inches asunder in well-tilled soil, being copionsly afforded water at the start. In four or five weeks the plants will have grown together. Although the plant endures uninjured every sort of weather, it is advisable in time of drought to sprinkle overhead freely once a day.—*Ibid.*

MUCH ADO ABOUT COIR.

[How time and money are wasted at the Imperial Institute.—ED. *T.A.*]

It is recorded in the abstract of the proceedings at the thirty-first meeting, on the 11th April, 1899, of the Indian Section Sub-Committee of the Imperial Institute, Sir Stenart Clive Bayley, K.C.S.I., in the chair, that Sir George Birdwood, one of the members of the Committee, reported that enquiries had been made by firms anxious to import coir fibre into the United Kingdom direct from India as to the best means of obtaining supplies, and also the amount of our coir fibre available for this purpose, and that the information asked for had been obtained and communicated at once to the enquirers. Yet, towards the close of last year Sir Frederick Abel, Bart, KC.B., D.C.L., &c., the Honorary Secretary and Director of the Institute, was moved to place himself in epistolary communication, by what is departmentally described as the "flying seal,"—whatever that may mean—with Dr. George Watt, C.I.E., Reporter in Calcutta on Economic Products to the Government of India, on the subject of coir. His letter is not given in the Annual Report of the Institute, which was presented to both Houses of Parliament by the Secretary of State for India, on behalf of the section, last month, nor is even an abstract of it offered. Whether the Institute had it in mind to improve its slender finances by

A LITTLE DABBLE IN COIR YARN,

or whether the Director only thought of ascertaining where he could secure, on exceptionally favonrable terms, the means for covering the floors of the long, and generally empty corridors of the Institute with coir matting, is thus left to the imagination. Be this as it may, the Reporter immediately placed himself in communication with various members of the mercantile community of Calcutta.

Thus it was that he was informed by Messrs. Bathgate Pim & Co., that they "handle that article to some extent," but they were of opinion that coir "of better quality at a cheaper price is to be obtained in Ceylon than in Calcutta." They determined, therefore, to send on the Reporter's letter to their firm in Colombo. In due course the Ceylon firm informed him that it would be glad "to undertake to supply annually the 300 to 400 tons of coir desired by the Imperial Institute authorities. As we are uncertain as to what form of coir is wanted, we are sending to you, under separate cover, samples of the products of the coconut husk, viz.: mattress fibre, first and second quality, bristle fibre, coir yarn, and coir dust. Please indicate which of these products is required by the Imperial Institute authorities." Messrs. McLeod and Co., of Calcutta, stated that they were large shippers of coir, and that they would be obliged if the Reporter would favonr them with full particulars of his requirements in order that they might be in a position to follow up the matter. Messrs. Blackwood Blackwood & Co. wrote that they were in a position to do business in coir, and would be pleased to learn if tenders for the supply of the article were required, and what quality was needed. Messrs. Ullmann Hirschtorn & Co. similarly expressed a wish to have details, together with a sample of the coir required. Messrs. Simpson & Co. said that they would be much obliged to the Reporter if he would favour them with the name and address of the officer in charge of the Institute to enable them to address him direct on the subject of coir. Messrs. F. Munjie & Co. wrote:—"Referring to your enquiry regarding any merchants in Calcutta who might be able and willing to undertake the supply of coir, we beg to state that we are able and willing to do the same, whether coir, coir fibre, or coir yarn, up to any quantity that you may desire, and all qualities, as we are thoroughly conversant with this class of business, and shall be glad to wait upon you with our samples and quotations on receipt of your reply mentioning the class of goods you require." Finally, the Inspector-General of Jails reported that his Department was prepared to supply coir fibre to the Institute and he asked for a statement of conditions and other particulars.

But it seems at last to have dawned on the Reporter that he had not addressed to his enquiries

TO THE BEST QUARTER,

for he was informed by the Bombay Chamber of Commerce that there were shippers of coir on the Malabar Coast, notably Messrs. Volkart Brothers, of Cochin and Tellicherry, and Messrs. Peirce Leslie & Co., of Cochin and Calicut. The Chamber then remarked that the latter "have their firm in London (2 Lime Street Square), and if the Director of the Scientific Department of the Imperial Institute will communicate with them be will no doubt obtain all possible information regarding the article." In other words, the Director could have obtained all the information that he needed on the subject of the supply of coir by trotting down from Kensington to the City, or writing a few lines to some well-informed commercial acquaintance in Mincing Lane, who would probably have placed himself at once in telephonic, or personal communication with Messrs. Peirce Leslie & Co., or some other firm of experts round the corner. The Collector of Malabar was referred to by the Madras Board of Revenue, and he said that Messrs. Peirce Leslie & Co. were willing to give the information that was desired. Meanwhile, however, the Deputy Collector at Cochin had referred to Messrs Aspinall & Co., Messrs. Grieve & Company, Messrs. Peirce Leslie & Co., Messrs Volkart Brothers, Messrs Ramachandra Mahadeva & Co., Mr Dharsey Khetser, Mr Gulaveney, Mr Kassein Haji Ibraim, Mr Kadam Kandi, and Mr Moidin Kutti, all of Cochin, about procuring 'brush and mat fibre," and the majority of these merchants said that they were willing to undertake the supply of the required quality and quantity of fibre. Messrs Peirce Leslie & Co. remarked that they were unable to give the information regarding the quality of fibre wanted by the Director in the absence of sample, but they suggested that the shipment of fibre can be made from Cochin to London direct to save the heavy cost of sending it to Madras.

The Collector of South Canara was also referred to by the Board of Revenue, and he placed himself in communication with Messrs Peirce Leslie and Co. at Mangalore, who informed him that the supply of "coir fibre in this District is small in comparison with the quantity obtainable in the Malabar District, and we do not think any firm here could ship to Europe at a price that would compete with shipments

FROM COCHIN AND CALICUT.

Our firm at these latter ports, we may mention, ship annually large quantities of coir fibre and yarn to Europe, and if Mr G W R Curtis would communicate with our London office, through whom all our business in Europe is worked, they would be pleased to give him all information. and to submit him samples with quotations of the various qualities usually exported from the Malabar Coast". Thereupon the Collector reported to the Board that there are two of the European firms at Mangalore who "do not wish to enter into the business of supplying coir or coconut fibre to Mr. G. W. R. Curtis, while the remaining firm, Messrs Peirce Leslie & Co., say that their London office would be pleased to give Mr Curtis all the information that he would require. and submit to him samples with quotations of the various qualities usually exported from the Malabar Coast. I do not think that any native firm would undertake the business." The record throws no light, sad to say, on the domicile, occupation, or needs of Mr. Curtis. But there is reason to suppose that he is one of the exceedingly few individuals who yielded in the year under notice to the temptation of making an enquiry of the Indian Section of the Imperial Institute about an Indian product that is thoroughly well understood in "the Lane," since some 152,800 tons of coir of the value of $2\frac{3}{4}$ crores of

rupees, or about £1,850,000, were shipped from India —mostly from the Malabar Coast—in the ten years ending 1897-98, the greater portion of which was "handled" in London.

The Report omits to state what was the outcome

OF ALL THE CORRESPONDENCE

that was caused by the Director's enquiry. Perhaps the subject is still under the consideration of the Indian Section, which is so badly off for something of a really useful nature to do. But the episode serves to show once again, that the "economic products" of India can be studied far better in the business haunts, of those who trade largely in them than at the Institute, whose motto might well be "Great cry but little wool." The suggestion would not perhaps commend itself to Mr. J R Royle, C.I.E., the Secretary and Curator of the Indian Section, who draws a salary of £500 a year. For, on the 24th October last, at a meeting of the Sub-Committee, a letter was read from him, in which he drew "attention to the fact that the present term of his appointment would expire on the 31st March, 1900, and asking whether it would be renewed, and if some addition to his salary could not be recommended." The Sub-Committee thereupon drafted a letter to the Secretary of State for India, in which it may, or may not have asked for enhancement of the salary. But as no more than £500 is budgeted for in the estimate of expenditure for 1900-1901 it may be concluded that Lord George Hamilton, while approving of the rentention of the services of Mr. Royle, regretted his inability to sanction an increase in conformity with the wishes of the present incumbent of the Curator's office. To most people who study the Report of the Sub-Committee it will probably appear that a salary of £500 does not err on the side of illiberality, for it means an expenditure by India of R625 per mensem, for which there is very little in the way of benefit to India to show.—*Madras Mail.*

RICE.

CHANGES IN THE VARIETY HANDLED ON THE PACIFIC COAST.

Within the last year or two, says the *San Francisco Grocer and Country Merchant*, a great change has come over the position of rice in this market. Up till that time the chief description sold here to white people was the Hawaiian product, which, under the reciprocity treaty came in free of duty; but since then the imports of this variety fell off, until it has almost completely disappeared, and is no longer a factor in the trade. The cultivation of rice in the islands appear to have largely give way to that of sugar cane and the more profitable articles; and the increase of the local population has not only consumed all that was raised there, but has called for extensive shipments of Louisiana rice from this market, as well as of other descriptions from China and Japan. Their normal parity, in fact, has been and is above ours; under which circumstances evidently they can send us little or no rice.

As the Island supply became exhausted, domestic consumption turned to the Japanese article or to that from Louisiana, according to which was the cheaper. Of late this has been the Louisiana article, as crops have been abundant there and prices low, while on the other hand values in the Orient, owing to the Indian famine, have been abnormally high. Jobbers have naturally given all possible encouragement to the Louisiana article, as, owing to the great varieties of it that are always on offer, it affords a much better chance of a profit than the foreign descriptions that come only in standard grades, and are consequently sold for the slimmest sort of a margin. The off grads of foreign would not be worth the freight here and the import duty; and consequently they are consumed at home, where, in fact, they constitute the staple diet of the people. The wonder is that jobbers do not follow the same policy with regard to sugar, instead of co-operating with the Trust to restrict the sale to limited varieties at fixed prices.

The changes that have taken place in the character of the staple consumed on the Pacific Coast have naturally given rise to a good deal of substitution and misrepresentation, which, when once stated, is apt to become by force of competition, more or less general. Louisiana was first substituted for Island, and now Louisiana, Japan, or rice grown in Louisiana from Japan seed, is being substituted for the genuine imported article. In many cases it is difficult, except for an expert to distinguish on sight, the one from the other, but on cooking the difference is quite manifest since the seed article does not cook dry and free like the imported, but comes out more or less gluey or mushy, so that the Japanese at least cannot be deceived by it; and it would be well for our readers to take note of this fact.

Another substitution that is now being tried is a mixture of a large proportion of low-grade Louisiana with China mixed for the genuine China mixed, the market value of which is always known to a nicety, and which consequently generally sells very close to cost. A practised eye will, by comparison, at least, readily detect the difference in this case by the size and appearance of the grain. The name "China mixed" unfortunately ends itself too easily to this sort of substitution, and should never have been adopted. It is in reality not China rice at all, but rice grown by Chinamen in Siam and shipped here via Hong Kong, thus covering up its origin.

While on the subject of rice it may be opportune to caution our less experienced readers against receiving any old and weevily stock in their warehouses and thereby infecting their goods, which very readily occurs. This, of course, is not likely to be sent them from any responsible source, as it is, in fact, tantamount to a crime. Fortunately, however, it is easy of detection, for if sacks containing weevily rice are left for half an hour in the sun the weevils will appear on the outside, and this is the test that consignments are subjected to by jobbers before receiving them into their warehouses. Even the exposure during the trip from the wharf, depot or warehouse is frequently sufficient to bring these animals to the surface; and goods infected in this way should never, on any account, be taken to accouut. The same applies to beans.

PEA NUTS OR EARTH NUTS FOR POULTRY.—In most of the coastal districts it is comparatively easy to obtain good crops of these "nuts." For poultry, according to an American authority, pea nuts are a food that can scarcely be excelled. In the experience of the authority quoted, they are far more satisfactory than maize, wheat, or oats for laying hens, as well as for growing chicks. Hens and chicks do not get so fat on them as upon grain. As a dainty to throw into the feeding yards, a few plants, nuts and all, come in very handy.—*Agricultural Gazette of New South Wales.*

Correspondence.

To the Editor.

THE DEATH OF SIR JOHN LAWES.

Analytical Laboratory 79 Mark Lane, London, E. C., September 6th, 1900.

SIR,—I send you a cutting from last Saturday's *Times* containing an appreciative memoir of the late Sir John Lawes whose death is very sincerely regretted by all those interested in agriculture who have read the numerous papers published during the past fifty years in connection with the well-known experimental plots at Rothamsted.

I have had the honor and pleasure of paying several visits to the well kept farm and the particular objects of the various experimental plots have been personally explained to me by Sir John Lawes, whose genial manner and kind hospitality always added so much to the pleasure of a visit to Rothamsted.

The writer in *The Times* in his reference to the absorption of free nitrogen from the atmosphere by leguminous plants, gives the impression that the more recent theory is, that these plants, CAN absorb free nitrogen *themselves* whereas the fact still remains as true now as it was when first enunciated by Sir John Lawes in 1861 and repeated in his essay on "Fertility" in 1881, that leguminous plants can only absorb nitrogen indirectly through the agency of bacteria, by which the primary work of fixation of the free nitrogen from the atmosphere is performed.

It may be useful to point this out as otherwise a wrong impression might be gathered from a perusal of this otherwise very correct memoir.

JOHN HUGHES.

[For the greater part of the notice in *The Times* see page 273.—ED. *T.A.*]

Re IMPORT DUTY ON TEA.

Hewaheta, Sept. 22.

SIR,—I would not abolish the import duty on tea, but would suggest that it be reduced to 25 cents per 100 lb. By so doing sufficient funds would be available to enable Government to appoint Tea Inspectors, whose duty it would be to inspect all tea coming into the Island and all tea leaving the island. Direct garden shipments might be passed without inspection, as the countries to which they go have their own inspectors.

Blends of pure Ceylon might be so stamped by the inspectors and blends of China and Indian and Ceylon stencilled in large letters across the packages.

If possible, a standard of quality should be fixed: it is not only the red leaf—for, excepting its bad appearance, it often draws a very good liquor—but some teas sold by public auction lately in Colombo consisting of whole invoices were objectionable: the dry leaf, bad in colour and smell; infused leaf, black and nasty, and liquors loathsome to the palate. Would some enterprising man get such teas analysed, possibly a standard in leaf might be fixed and a standard of liquor based on chemical analysis. Should the Tea Inspector think any teas not up to this standard of liquor he might hand samples to the Public Analyst. If Colombo became the centre of the tea industry—and I see no reason why it should not—what a grand thing for Colombo; and, as we should always be the nearest producers to the central market, I see no reason why we should not reap some advantage. The question of blending China tea with Ceylon applies just as much now, as it would if the blending were done in Colombo, except that the Government Inspectors here would have more hold than when the blending was done all over the world.

If any confusion arose *re* the import duty on Tea being mixed up with the Tea Cess, doubtless some arrangement could be come to with Government *re* division of duty, but I am inclined to think in a very few years the revenue from the import duty of 25 cents per 100 lb. would be far in excess of the cost of collecting and payment of inspectors, and Government might see its way to hand over any balance to the "Thirty Committee" for exploiting tea in foreign countries.—Yours, &c.,

E. T.

P.S.—Would the nominal duty of 25 cents per 100 lb. stand in the way of houses making Colombo their headquarters? I hope not.

E. T.

RUBBER PLANTING IN TOBAGO, WEST INDIES.

Richmond, Tobago, Aug. 28.

DEAR SIR,—The cultivation of rubber, particularly the Castilloa elastica, is more than likely to prove very successful in this island.

I recently sent to London a sample, weighing 21 lb., of rubber obtained from Castilloa trees I planted on this estate eight to nine years ago. It was valued at 3s 6d per lb. by Messrs. Lewis and Peat, who report that this rubber would have a ready sale at that price.

I cannot yet say what the yield of rubber per tree is here, as the experiments I made in tapping were carried out just after an exceptionally dry season; and being anxious not to run the risk of spoiling the coming seed crop, I only tapped the trees very lightly. But from a tree tapped lightly on three different occasions at a week's interval, I obtained a half-lb. of rubber.

The Castilloa does remarkably well here. One tree eight years old measures five feet in girth at three feet from the ground, and another of the same age measures four feet and ten inches.

The Louis d'Or rubber plantation, started here two years ago, is progressing exceedingly well under the able management of Mr. T. Orde. The estate has now 160 acres of Castilloa and 40 acres of Ceara rubber. There are several other estates in the island now being planted up with cacao, rubber, nutmegs and coffee, all of which thrive well in the Windward and Northern Districts.

I find that cacao bears very well under the shade of Castilloa. Nine years ago I planted an acre of rubber and cacao together—the rubbers at 24 feet apart, cacao at 12 feet—and so far I have noticed very little, if any, difference in the bearing of these cacao trees and those under the shade of the "Bois immortelles." Finding this the case I planted last year 15 acres in the same manner, and there is every reason to expect that in another eight or nine years, they will give a gross return of about £30 per acre. Coffee also bears very well under the Castilloa,

A question of great importance to rubber planters is whether a paying quantity of rubber can be got from either one year-old seedlings or saplings three to four years old. If it proves that this can be obtained, of course, close planting would be carried out, followed by a quick return. Can you give me any information on this point?

Last year I sent to England the bark of a four-year old Castilloa tree to be experimented upon. The dry bark weighed three lb, all but one oz., and it gave 4½ oz. of rubber. As this was the result of a laboratory experiment, I cannot say if the process, applied on a large scale, would make close planting profitable or not.

Another matter of great importance is to ascertain the quickest and most effective method of tapping the trees. I hope that Mr. Willis will, before long, publish details of the experiments carried on at the Gardens since the issue of his circular of June, 1899.—I am, dear sir, yours truly,

M. SHORT.

RUSSIAN TEA TRADE.

Kandy, 26th Sept.

SIR.—I herein enclose copy of letter and accompanying despatches received from Government on the subject of the effect of the Chinese Crisis on the Russian Tea Trade.—I am, sir, yours faithfully,

A. PHILIP,

Secretary, Planters' Association of Ceylon.

Colonial Secretary's Office, Colombo, 25th September, 1900.

Sir,—I am directed by His Excellency the Governor to forward to you for the information of the Planters' Association, the enclosed copy of a despatch from the Secretary of State for the Colonies, together with copies of the despatches from Her Majesty's Ambassador at St. Petersburg on the subject of the effect of the Chinese Crisis on the Russian Tea Trade. —I am, sir, your obedient servant,

(Signed) A. G. CLAYTON, for Colonial Secretary.
Secretary, Planters' Association of Ceylon.

(Copy No. 146. Commercial.)

St. Petersburg, 8th August, 1900.

My Lord,—With reference to my despatch No. 134 of the 26th ultimo I have the honour to transmit to your lordship herewith a further report which has been addressed to me by Mr. Cooke on the subject of the Crisis in China and the Tea Trade.—I have &c.,

(Signed) CHARLES S. SCOTT.

The Marquess of Salisbury, K.G., &c.

THE CHINESE CRISIS AND THE TEA TRADE.

The *Commercial and Industrial Gazette* of St. Peterburg, commenting on the nominal opening of the great Nijni-Novgorod Fair (July 15 to 28) with reference to the prospect of the tea trade states as follows:—The Chinese Crisis came on just when the first and principal crop at Hangkow was brought up and ready for despatch for Russia. The question is: was it safely sent away? The two routes are by sea from Hankow to Odessa, and via Siberia overland. The latter direction is either (1) by water to Liantsen and thence by land to Kaljan and through the Mongolian steppe to Kiata or (2) along the Amur, and in this case, from Hankow by sea to Vladivostock or to Nikolaevsk. According to Moscow tea dealers, up to June 8 to 21, 1900, the purchases (made were 648,955 half-chests of the first crop against) 609,052 in 1899) of which 590,306 were bought by Russian firms, or 35,552 more than last year. The first crop is the all important one in the tea trade, 2nd and 3rd crops being comparatively insignificant. This first crop being safely brought in at Hangkow, and Russia having solid supplies over from last year, though mostly of the inferior 2nd and 3rd crops, there need not as yet at least be any sensible disturbance in the international market. The whole question is how much has been despatched from Hangkow and in what direction? The disturbances became serious just as the ordinary despatch from Hangkow should have begun. Thanks to the crisis and to the shallowness and other difficulties of navigation on the Amur, the oversea route alone remained. But here too the Volunteer Fleet steamers were taken by the Government and difficulties arose in finding others. All that is known at present is that the Steamship "Kherson" (Volunteer Fleet) has arrived with tea at Odessa, as also the Steamship "Odessa," while the "Yaroslav" (Volunteer Fleet) has passed Port Said with tea for Odessa. The English Steamship "Drumgard" chartered by the Volunteer Fleet, has left Hangkow with tea as also the "Siam" of the East Asiatic Company, the latter with 70,000 half-chests, originally destined for Siberia. More black tea was bought up at Hangkow this year than last, and bought up earlier, so the stocks there are larger. Ceylon and London teas (the latter both Chinese and Ceylon) are in greater stocks than last year, and now probably rapidly increasing. Some 30,000 chests of brick tea were sent in the spring from London to Vladivostock, after failing last year to reach Siberia via the Obi and Yenisei route. On July 1 to 14, 1900, there were 114,192 half-chests in Moscow Customs Depôts, against 66,908 in 1899. In general there is considerable doubt and hesitation in the market, all awaiting events, though some have raised prices. Prices in Siberia have risen considerably and promise to continue rising. Much depends on what trade is done at Nijni Novgorod market now opening.

(Signed) HENRY COOKE.

PLANTING NOTES.

RATWATTE COCOA COY.—We have to thank Messrs. Geo, Steuart & Co., (agents and secretaries) for a copy of the directors' report which was to have been submitted at the annual meeting in Kandy this afternoon. It is published on another page, and shows that, while no dividend is recommended, a profit of R5,320 has been made on the crop-bearing portion of the estate and that the prospects both for tea and cocoa for the coming season, are good.

BAKED LAND.—A good many people who experience great difficulty in working land that bakes readily after rain may be interested in the following advice issued by the Texas Agricultural Experiment Station:— "There are several things which can be done to improve your land, the choice of which one, or of a combination of two or more, will depend upon your local surroundings. Subsoil ploughing will prove of benefit. If you combine with this a considerable quantity of lime, say at the rate of one-half ton per acre, it will perhaps prove more beneficial than anything else that you could do. But as this may be too expensive you may find it necessary to try this: Deep ploughing, eight to ten inches, and the application at the same time of large quantities of swamp muck, barnyard manure or any fertiliser rich in vegetable mould. Green manuring, that is ploughing under a green crop of any kind of forage or luxuriant growth, is a practice method of great value. Wood ashes in large quantities, two or three tons to the acre, will prove very beneficial. This is perhaps the only remedy which would prove of any value so late in the season as it is now. The deep ploughing and heavy dressings of manure should be done not later than midwinter."—*New South Wales Agricultural Gazette*

COFFEE AND PEPPER FROM WESTERN INDIA.

We call attention to the annual Report of Mr. R. Tatham of Messrs. Arbuthnot & Co., Tellicherry, giving the year's exports of the two staple products, coffee and pepper. It will be seen that apart from 127,331 cwt. of plantation coffee, no less than 81,000 cwt. are said to be native coffee; while 168,000 cwt. pepper are declared to be of a value exceeding 6,300,000 rupees! — and the planters, Mr. Tatham says, are more and more growing pepper as a bye-product to coffee. This is just what we have wanted the tea planters of Kelani Valley and other similar districts to take up. If they cannot do much in rubber or cinchona, they should do a great deal in pepper; for Kegalla was a famous pepper-growing district 150 years ago, as also the upper portions of the Matara division of the Southern Province. We would therefore press more and more for a revival of the pepper-growing industry, among the lowcountry planters of Ceylon.

PLANTING IN B. C. AFRICA: COFFEE, &c. IN NYASSALAND.

(By an ex-Ceylon planter.)

Mlanji, B. C. Africa, Aug. 16.

This is supposed to be a country void of comforts, and inhabited by savages; at least anybody reading the books written by most travellers would arrive at that conclusion. I myself came here expecting to have to rough it and prepared to do so, even to the same extent as the savage races whom I expected to have to civilize.

Now I find I was mistaken and that every comfort that the most fastidious appetite could desire is here; also dwelling-houses not to be despised by the most ambitious orientals—brick houses with windows and doors of excellent finish; and wattle-and-daub bungalows which would put some of the Ceylon planters' P.D. houses in the shade.

To enumerate some of the

VARIOUS PRODUCTS

we have in cultivation, as well as the fruits, vegetables, and grains we luxuriate in, might surprise some of your readers. Of Ceara rubber we have growing trees 12 feet high, with a diameter of one foot at only three or four years' age. This rubber is being planted pretty extensively as boundary trees, and amongst the coffee on some estates. It may do better than it did in Ceylon, as the climate here is more like that of the home of the Ceara tree. At all events the tree seems to be a deeper feeder here, and does no harm to coffee planted along with it, as it did in Ceylon.

CACAO.

I only know of one plant in the country, and Mr. J W Moir, of Lauderdale, is the owner. This plant was imported about five or six years ago, and is now only about four feet high, and measures three or four feet across the branches,—not a promising specimen by any means, especially to any one who has seen the growth of cacao in Dumbara and Matale. My opinion is that our climate in Nyassaland is not suited for cacao, unless near the rivers and lakes at a lower elevation, but there the rainfall is much less—25 to 30 in. We have too great extremes of heat and cold. We get frost in June and July and in October and November dry heat, reaching 96° to 100° in the shade, which neither

COFFEE NOR CACAO

likes. Shade may mitigate those evils, but I doubt if the rainfall is sufficient for cacao even with shade, but I may be wrong; at all events, it does not thrive here.

CARDAMOMS

should suit our climate well. We have none here that I know of. I brought some seed with me from Ceylon, and gave them to the African Lakes Co.'s Gardener to plant, but I do not think he ever got them to grow; at least I have not heard of any in the country. We have growing wild here any amount of *Amomum meleguetta*, Grains of Paradise, which produce a seed that was much sought after in days of old, and largely exported from the west coast, but now superseded by Malabar and Mysore cardamoms. I gathered and sent home to my London agents over half a ton of seed a few years ago, but they could not find a purchaser for the consignment, and it was destroyed in bond. The undergrowth of our forests in the wetter parts of this country is composed of this variety of cardamoms, with two other sorts nearly allied to this. Ginger grows well here, and is cultivated by the natives, along with Turmeric, as a condiment.

TOBACCO

of an excellent quality can be and is grown here; the soil and climate seem to suit the weed. And when grown from a fine variety seed is of excellent quality. I have made cigars equal in flavour to the best Havana, but to get the nigger to manufacture a couple of cheroots of the same quality would baffle an expert's patience and perseverance —nothing but machinery will keep the kaffir uniform.

FIBRES.

Fibres, we have galore in the bush, *Sanseviera* of two kinds grow wild. We have a variety of China grass, as well as the real, imported variety. A number of trees supply bark of which the natives make excellent rope, as also two "Momba" trees, from which the bark cloth to cover the savage is made, as well as excellent cordage and binders for housebuilding, etc.

Aloes are common all over the country, and one or two indigenous varieties are found in the bush. We have some excellent timber trees here, Mahogany trees, 150 ft. high, and 20 to 30 ft. in circumference. African teak and a variety of legnamsuti, as well as many other valuable cabinet woods are plentiful.

AUSTRALIAN GUMS

grow well, blue and red gums thrive splendidly. Robusta trees I have growing over 100 ft. high, and 5 ft. in circumference, at 6 years' age—I have plants from the seed of those trees 8 and 10 ft. high at 18 months age. White ants do an awful amount of damage to gums, causing the death of many plants, and even well-grown trees. Annatto trees of enormous dimensions are here, and they bear very large crops of seed, but I never thought it worth while extending their cultivation as the price of the article is so

low. I have one Pepper vine doing well. Vanilla and Kola plants were introduced, but they died before reaching maturity. Wild Pepper, both the vine and the tree varieties, are to be found in the forests.

CINCHONA.

Ledgeriana and a good hybrid were introduced by somebody and are to be found on some estates, but they are not cultivated to any extent. I have often thought of putting in a nursery of Ledgeriana, as it seems to grow well, and now the price is better, there is encouragement for attention to this valuable tree.

I remember the days when the Dimbula planters used to value Cinchona Succirubra trees at so many rupees each, and calculate their fortunes by the number of growing trees, and their age;—quinine was then selling at a guinea per ounce. I went in for planting cinchona with the rush, but found when my trees were fit for harvesting that the bark, when delivered in Colombo, did not pay.

CHILLIES.

Some time ago I saw a letter in the *Observer* from somebody in Rakwana, enquiring about the cultivation of chillies. I have 100 odd acres planted between the lines of coffee as a catch crop; they are now three years old and lots are beginning to die off after continuous cropping for two years. After the first crop I cut them down and dug them in as manure to the coffee; they grew up again quickly, and I have now nearly finished a second crop. I intend to uproot and dig them in altogether in the course of a few months more, as the coffee has now closed in upon them and they have served me well, having more than paid for the opening of the coffee-clearing. I could not pick half the crop for want of labour; but I should say each tree gave more than 1 lb. of dry chillies, and the price I got was from 37s 6d to 56s 6d per cwt. The variety I have planted is the common bird's-eye used by the Ceylon cooly and found growing on most estates wild in Ceylon. This kind, if of good quality, bright and clean, always meets with a ready sale. I have tried other varieties, and Capsicums, but there is a very limited demand and uncertain market for any kind, except the very pungent bird's-eye chillies. Chillies take about eight months before they begin to bear fruit.

I might give your readers a list of our

FRUITS

to shew them that we are not wanting for delicacies for the table:—Soursop, oranges, bullock's-heart, pomegranate, loquats, guavas, red China, pink-hearted and gooseberry varieties; papaws, peaches, plums, figs are here, all in bearing for the past two or three years. Apples, pears, and cherries are growing on one or two estates. Pineapples, raspberries and Cape gooseberries are common everywhere, the latter a weed like tomatoes on estates. Flowers—shoe-flower, convolvulus, roses of different kinds, amaranthus, nasturtiums, caliopsis, geraniums—are in profusion in most little garden plots in front of bungalows,

FOOD SUPPLIES.

By way of food supplies we can boast of the cheapest if not the choicest in the world. English potatoes 1d per lb.; sweet potatoes 3d per bushel; cabbages 1d to 2d each; village fowls 2d each; rice 1d per lb.; pumpkins and cucumbers about 6d per basket; beans in great variety, Indian corn and millet, all at 1s per load of about 60 lb.; eggs 3d per dozen; plantains and bananas in great variety, 3d per bunch.

Store prices for imported goods are:—Flour 6d; sugar 6d; tea 2s 6d; jams 1s; butter 3s per lb.; and other articles in proportion. Cassava aud arrowroot are grown everywhere, and are as cheap as other native products. We can always get fairly good curries made here; the only thing we do miss is the coconut. Breadfruit I have never seen here. We have no jaks either; I had some plants once growing about 2 ft. high, but they were eaten by white ants.

HENRY BROWN.

COFFEE PLANTING IN B. C. AFRICA.

[TO EDITOR "CENTRAL AFRICAN TIMES."]

Dear Sir,—As I have already stated I shall only be too glad to visit any plantation where berries are in a state of growth, with Mr. Henry Brown or any other planter, so as to convince me that we are troubled with much worse enemies whether borer or "drought which do the maximum amount of damage to our coffee," and I should like to see "some old estates where no bug is to be found which have 80 to 90 per cent spotted and light berry caused by these enemies."—I am, &c.,

KENNETH CAMERON.

Namasi, August 9th.

Dear Mr. Editor,—The first time I observed coffee in this district really affected by drought was in 1896, when the thermometer registered 98 degrees Far. (at some stations over 100 degrees was registered I believe). The coffee drooped, the leaves and bark shrivelled up, the natural healthy flow of sap was checked, fissures were laid open in the bark of the trees, and canker set in on fifty to seventy per cent of my coffee trees after which bastard and barren wood was very visible.

Dr. Macvicar paid me a visit after another dry season, 1897, when my coffee also suffered from drought and in the course of conversation one day asked me if I had anything I would like examined with the microscope. I suggested the sap of coffee trees in the shade and in the open. He first went to work on the leaves and bark from a number of trees in the open. When the sap from those trees was examined it was found to contain brown spots which proved beyond a doubt that the sap cells were damaged and the sap diseased. When the sap of the bark or leaves of the shaded trees was examined it was found to be perfectly natural and of a light green colour.

The above observations, I think, prove beyond a doubt that our coffee is damaged by excessive heat and the fact is well-known that coffee will not do well where the shade temperature reaches ninety degrees without shade and heavy shade too.

I have tried heavy pruning and cutting down both as a remedy for sunstroke and canker in coffee, but when the trees are damaged into the ground as is often the case, it is as bad as canker in the flesh of a human being and had better be abandoned to the inevitable. Roadside shade trees are frequently cut down on the plains in India for sunstroke and canker.
—Yours, &c.,

H. B.

Mlanje, 1st August.—*Central African Times.*

PROPAGATION OF MANGOES BY BUDDING.

The following interesting paragraph occurs in Mr. Gollan's report on the Saharanpore Botanical Gardens for 1889-1900:—In paragraph 88 of the last annual report it was noted that the mango was said to be successfully propagated in Jamaica by budding. With a view of testing this assertion a series of experiments were conducted last summer. The first trials were made about the beginning of April and were repeated at intervals of a fortnight until the end of August. No difficulty was experienced during the whole period covered by the experiment in finding clean and apparently well developed buds, nor was there any difficulty in finding stocks with bark that would rise readily, but only one of the various lots of buddings which were made proved a success. In the successful case the buds were inserted on the stocks on the 4th July and they began to shoot out in about a month after the date of insertion. In every trial a dozen plants were operated on, and as eight plants out of the dozen budded on the 4th July were successful, this is a fair percentage when comparisons are made with other kinds of trees which are not easily budded. On the 20th of the same month, and on two dates in August, a dozen plants were in each instance operated on, but not a single success was met with, nor on any of the dates on which budding was tried prior to the 4th July. The budded plants now stand with shoots from 12 to 15 inches long, and by July next, or within the year from date of budding, they will be quite fit to plant out to where they may be intended to be grown. I am not yet prepared to say that the method is an improvement on the universal system of propagating the mango under grafting by approach, but as it is intended to have a more extended trial made in July next, I have to give a definite opinion on this point in the next annual report.—*Gardening and Planting*, Sept. 13.

Cocoa in Dutch Guinea.—The cocoa crop in 1899 exceeded that of the previous year by about 50 per cent; prices have shown an upward tendency. The total crop for the year was 3,969,945 kilos. The following are the amounts exported during the past five years:—

Year.		Quantity. Kilos.
1895	... ...	4,456,338
1896	... ...	3,302,567
1897	... ...	3,584,715
1898	... ..	2,830,414
1899	.. ..	3,859,980

—*Planting Opinion*, Sept. 22.

RAINFALL RETURN FOR COLOMBO.

(*Supplied by the Surveyor-General.*)

	1895.	1896.	1897.	1898.	1899.	Av of 30yrs.	1900.
	Inch.	Inch	Inch	Inch	Inch.	Inch.	Inch.
January ..	5·00	2·92	3·81	2·32	6·98	3·22	3·72
February ..	0·81	0·35	1·68	1·98	2·78	1·93	0·63
March ..	1·84	5·64	3·66	4·21	0·88	4·78	3·71
April ..	9·34	5·93	10·97	22·81	6·66	11·31	15·12
May ..	10·09	9·31	8·30	5·80	17·73	12·09	10·63
June ..	13·99	8·37	10·14	10·94	9·23	8·37	7·83
July	0·52	2·85	5·24	6·15	1·11	4·38	6·77
August ..	0·92	6·35	9·09	0·97	0·62	3·67	7·35
September	4·09	10·99	4·58	6·90	1·48	5·01	4·00
October ..	30·36	16·78	4·71	20·60	12 99	14·52	0·12*
November..	5·83	19.81	11·66	17·38	8·58	12·66	
December..	9·44	11·76	8·89	3-05	4·44	6·39	
Total..	92·23	101·06	82·73	103·11	73·48	88·33	59·88

* [From 1st to 3rd Oct. 0 12 inches, that is up to 9-30 a.m on the 4th Oct.—Ed. *C.O.*]

Ceylon Rainfall.

The P. W. D. Meteorological Observations or Aug 1900.—We append the Monthly Return of in from which it will be seen that the highest fall in Aug, was at Padupola in the Central Province. 46·71 inches and the lowest at Marichchukaddi in the Northern Province, 0·03 inches.

Western Province.

Negombo, Mr. Bucknall (6) ... 4·82
Kalutara Mr. Gregson (36) ... 7·49
Labugama, Mr. Bond (369) ... 12·37
Henaratgoda, Mr. Silva (33) .. 7·79

Central Province.

Katugastota, Mr. Morgan (1,500) ... 4·88
New Valley, (Dikoya) Mr. Ward (3,700) .. 20·41
Helboda (Pussellawa) Mr. Gosset (3,300) .. 17·39
Yarrow Estate, .. Mr. Padwick (3,400) 10·48
Peradeniya Mr. ... MacMillan (1,540) ... 8·04
Duckwari, Mr. Edwin (3,300) ... 9·55
Caledonia, Mr. Goork (4,273) .. 14·75
Pussellawa, Mr. ... Powell (3,000) .. 10·67
Hakgala, Mr. .. Nock (5,581) ... 6·59
S. Wanarajah Estate, Mr. Tatham (3,700) .. 23·49
Padupola, Mr. Ward .. (1,636) ... 46·71
Mylapitiya, Mr. Fletcher (1,707) ... 0·30

Northern Province.

Mullaittivu, Mr. Ebert (12) .. 0·06
Jaffna Mr. Macdonnel (8) Nil
Mankulam, (N. Road) Mr. Ebert (167) ... Nil
Elephant Pass, Mr .. Silva (7) – Nil
Vangalachettykulam, Mr. Oorloff (179) .. Nil
Point Pedro Mr. Chitampalam (24) ... 0·83
Jaffna College, Mr. Cooke (9) .. Nil
Kayts, Mr. Macdonnel (8) .. Nil
Kankesanturai, Mr. Pararachasinghe (10) .. 2·00
Pallai, Mr. Silva (24) .. Nil
Murlkandy, (North-Central Road) Mr. Silva (7) Nil
Nedunkeni, Mr. Ebert (122) ... 1·23
Chavakachcheri, Mr. Silva (16) ... Nil
Udupiddi, Mr. Brown (35) .. 1·47
Marichchukaddi, Mr. Thampue (14) 0·03
Muruugan, Mr. Walker (52) Nil
Vavuniya Mr. Ebert (318) 1 71

Southern Province.

Ella Vella Mr. Caldicott (262) 9·86
Kekanadura, do (150) 7·05
Denagama, do (286) 10·20
Udukiriwila Mr. Lourensz (235) .. 4·84
Kirama, Not received (260) —
Hali-ela Mr. Caldicott (200) 11·73
Tissa Mr. Silva – 1·01
Matara Mr. Caldicott (15) 2·62
Dandeniya, do (157) 8·96
Urubokka, Mr. Caldicott (890) 12·19
Tangalla Mr. Russell (94) 4·26
Mamadola, Mr. Doole (56) .. ·20

Eastern Province.

Irrakkamam, Mr. Bower (42) ... 1·62
Devilana, Mr. Vanderstraaten (136) Nil
Sagamata, Mr. Bower (40) ... 0·60
Ambare, do (65) 1·47
Kantbalai, Mr. Carte (150) 0·14
Allai, Mr. Carte (95) 0·75
Rukam, Mr. Vanderstraaten (120) ... Nil
Periyakulam, Mr. Carte (20) ... ·35
Chadaiyantalawa, Mr. Edge (57) 0·10
Kalmunai, do 12) 1·46
Rotewewa, do (30) 1 02
Lahugala, do (70) 2·30
Naulla, do (30) 3·50
Andankulam, Mr. Carte (41) ... 1·80
Manalpuddy, Mr. Vanderstraaten (21) ·50
Maha-Oya-Tank, Mr. Vanderstraaten (190) 1·82
Potuvil, Mr. Sinnayah (10) 1·56

N.-W. Province.

Magalawewa, Mr. Gunaratna (176) .. 3·75
Maha Uswewa tank, Mr. Adams (160) ... 0·60
Tenepitiya, Mr. Churchill (8) ... 0
Batalagoda, Mr. Madahapola — 3·99

N.-C. Province.

Kalawewa, Mr. Chellappah (268) Nil
Maradankadawala, Mr. Emerson (443) ... 0·31
Mihintale, Mr. Ondaatje (354) ..
Horowapotana, Mr. Ondaatje (217) .. 0
Madawachchiya, Mr. Ondaatje (285) .. 0·90
Topare, Mr. Jayewardane (200) .. Nil
Minneriya Mr. Eves — Nil

Uva Province.

Bandarawela, Mr. Tocke (4,000) .. 1·20
Haldummulla, Mr. Kanagaratnam (3,160) .. 2·05
Kumbukan, Not received (446) ... —
Koslanda, Mr. Rowland (2,258) ... 0·77
Tanamalwila, Not received (550) .. ..
Bibile, Mr. Silva (680) 0·92
Taleena, Mr. Fernando (1,100) .. Nil
Alutnuwara—Mr. Leembruggen (300) 0·23

Sabaraoamuwa.

Ambanpitiya, Mr. Dassanayaka (729) 7·85
Pelmadulla, Mr. Robertson (480) 21·46
Kolonna Korale (Hulanda-oya) Not received (203) —
Avisawella, Mr. Clarke (105) .. 19·65

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transactions
Agra Ouvah Estates Co., Ltd.	500	950	—	—
Ceylon Tea and Coconut Estates	500	—	—	—
Castlereagh Tea Co., Ltd.	100	90	95	—
Ceylon Hills Estates Co. Ltd.,	100	—	—	—
Ceylon Provincial Estates Co Ltd.	500	500	—	500
Claremont Estates Co., Ltd.	100	—	—	—
Clunes Tea Co., Ltd.	100	75	—	—
Clyde Estates Co., Ltd.	100	40	—	—
Doomoo Tea Co., Ltd.	100	60	—	—
Drayton Estate Co., Ltd.	100	120	150	—
Eila Tea Co., of Ceylon, Ltd.	100	50	60	—
Estates Co., of Uva, Ltd.	500	220	250	220
Gangawatta	500	—	—	—
Glasgow Estate Co., Ltd.	500	—	975	—
Great Western Tea Co.,	500	625	—	—
Hapugahalande Tea Estate Co.	200	—	—	—
High Forests Estates Co., Ltd	500	550	—	550
Do part paid	350	—	—	—
Horekelly Estates Co., Ltd.	100	—	70	—
Kalutara Co., Ltd.	500	—	375	—
Kandyan Hills Co., Ltd.	100	—	70	—
Kanapediwatte Ltd.	100	—	90	—
Kelani Tea Garden Co., Ltd.	100	—	—	—
Kirklees Estates Co., Ltd.	100	—	120	—
Knavesmire Estates Co., Ltd.	100	—	67½	—
Maha Uva Estates Co., Ltd	500	—	—	400
Mocha Tea Co., of Ceylon, Ltd.	500	675	—	—
Nahavilla Estate Co., Ltd.	500	—	400	—
Nehoda Tea., Co. Ltd	500	—	500	—
Nyassaland Coffee Co. Ltd	100	—	—	—
Ottery Estate Co., Ltd.	100	—	—	—
Palmerston Tea Co., Ltd.	500	—	500	—
Penrhos Estates Co., Ltd.	100	—	100	—
Pine Hill Estate Co., Ltd.	60	—	52·50	—
Pitakanda Tea Company	500	—	—	—
Putupaula Tea Co., Ltd.	100	—	—	—
Ratwatte Cocoa Co., Ltd.	500	—	—	—
Rayigam Tea Co. Ltd.	100	—	57½	—
Roeberry Tea Co., Ltd.	100	60	—	—
Ruanwella Tea Co., Ltd.	100	—	40	—
St. Hellers Tea Co., Ltd.	500	510	..	—
Talgaswela Tea Co., Ltd.	100	35	...	—
Do 7 per cent Prefs.	100	..	.	...
Tonacombe Estate Co., Ltd.	500	..	450	...
Udabage Estate Co., Ltd.	100	...	...	..
Udugama Tea & Timber Co., Ltd.	50	..	..	..
Union Estate Co., Ltd.	500	200	...	...
Upper Maskeliya Estate Co. Ltd.	500	—	450	..
Uvakellie Tea Co., of Ceylon, Ltd.	100	65	75	..
Vogan Tea Co., Ltd.	100	...	80	75
Wanarajah Tea Co.,Ltd.	500	..	1060	..
Yataderiya Tea Co., Ltd.	100	...	375	..

CEYLON COMMERCIAL COMPANIES

Company	paid p. sh.	Buyers.	Sellers.	Transactions
Adam's Peak Hotel Co., Ltd.	100	25	50	..
Bristol Hotel Co., Ltd.	100	..	125	...
Do 7 per cent Debts	100	107·50	...	..
Ceylon Gen. Steam Navgn. Co., Ltd.	100	...	225	...
Colombo Apothecaries' Co. Ltd.	100	140	142·50	..
Colombo Assembly Rooms Co., Ltd.	20	15	..	...
Do prefs.	20	...	..	..
Colombo Fort Land and Building Co., Ltd.	100	..	100	—
Colombo Hotels Company	100	291	300	..
Galle Face Hotel Co., Ltd.	100	—	..	145
Kandy Hotels Co., Ltd.	100	...	130	...
Kandy Stations Hotels Co.	100	..	25	...
Mount Lavinia Hotels Co., Ltd.	500	175	200	...
New Colombo Ice Co., Ltd.	100	180	..	185
Nuwara Eliya Hotels Co., Ltd.	100	25	30	..
Do 7 per cent prefs.	100	..	100	..
Public Hall Co., Ltd.	20	15	16	..

LONDON COMPANIES *

Company	paid p. sh.	Buyers.	Sellers.	Transactions
Alliance Tea Co., of Ceylon,	10	8½	9½—10	..
Anglo Ceylon General Estates Co.	100	..	35—45	..
Associated Estates Co., of Ceylon	10	—	3—4	...
Do. 6 per cent prefs.	10	..	6½—7½	..
Ceylon Proprietary Co.	1	...	⅝—⅞	..
Ceylon Tea Plantation Co., Ltd.	10	..	26—27	..
Dimbula Valley Co., Ltd.	5	..	5½—6	..
Do prefs.	5	..	..	...
Eastern Produce & Estates Co.	5	...	5½—5¾	...
Edeiapolla Tea Co.,	10	...	8	...
Imperial Tea Estates Co., Ltd.	10	...	..	.
Kelani Valley Tea Asscn., Ltd.	5	..	5—6	...
Kintyre Estates Co., Ltd.	10	...	7—8	..
Lanka Plantation Co., Ltd.	10	4½	4—5	..
Nahalma Estates Co.,Ltd.	1	—	¼—¾	..
New Dimbula Co., Ltd.	1	...	2¾—3	..
Nuwara Eliya Tea Estate Co., Ld.	10	—	...	10
Ouvah Coffee Co., Ltd.	10	..	5—7	...
Ragalla Tea Estates Co., Ltd.	10	..	10	..
Scottish Ceylon Tea Co.,Ltd.	10		13—15	...
Spring Valley Tea Co., Ltd.	10	3	4—5	..
Standard Tea Co., Ltd.	6	..	11—12	..
The Shell Transport and Trading Company, Ltd.	100	..	...	..
Yatiyantota Ceylon Tea Co., Ltd.	10	...	8—9	...
Do. pref. 6 o/o	10	...	9¾—10¼	..

BY ORDER OF THE COMMITTEE.

Colombo, October 5th, 1900.

* Latest London Prices.

THE LOCAL MARKET.

(By Mr. James Gibson, Baillie St., Fort.)

Colombo, Oct. 4th, 1900.

COFFEE:—		
Estate Parchment per bushel	R8·00 to 10·50	
Chetty do do	Nil.	
Native Coffee per cwt.	Nil.	
do F. O. B per cwt.	Nil.	
Liberian coffee:—per bushel	Nil.	
do cleaned coffee:—per cwt	Nil.	
Cocoa unpicked:—per cwt	Nil.	
do cleaned do	Nil.	
Cardamoms Malabar per lb	80c to 1·00	
do Mysore do	R1·25 to 1·45	
RICE:—		
Soolai per bag of 164 lb. nett	R9·75 to 10·00	
1st quality:—per bushel	R3·75 to 3·80	
Soolai 2 & 3rd. do do	R3·75 to 3·80	
Coast Calunda	R4·12 to 4·25	
Coast Kara	R3 87 to 4·02	
Kazala	R3·65 to 3·68	
Muttusamba Ordinary	R5·25 to 6·00	
Cinnamon per lb No 1 to 4	53½c	
do do 1 and 2	62½c	
do Chips per candy	R92·50 to 95·00	
Coconuts Ordinary per thousand	R35·00 to 38·00	
do Selected do	R36·00 to 39·00	
Coconut Oil per cwt	R14·12 to 14·37	no business done
do do F. O. B. per ton	R282·50 to 287·50	no business done
POONAC:—		
Gingelly per ton	R102·50	
Coconut Chekku do	R82·50	
do Mill (retail) do	R85·00	
Cotton Seed per ton	R87·50	
Copra per candy		
Kalpitiya do	R43·00 to 44·50	
Marawilla do (Boat)	R42·00 to 43·50	
Cart Copra do	R36·00 to 41·00	
Satinwood per cubic feet.	R2·00 to 2·25	
do Flowered do	R5·00 to 6·00	
Halmilla do	R1·90	
Palu do	R1·00 to 1·12	
Ebony per ton	R75·00 to 175·00	
Kitul fibre per cwt	R30·00 to 32·00	
Palmyra do do	R5·00 to 13·00	
Jaffna Black Cleaned per cwt	R13·00	
do mixed do	R10·00 to 11·50	
Indian do	R7·00 to 10·50	
do Cleaned do	R8·00 to 13·00	
Sapanwood per ton	R50·00 to 55·00	
Kerosene oil American per cases,	R6·75 to 7·00	
do bulk Russian, per tin	R3·12 to 3·15	
do Russian per cases	R6·50 to 6·75	
Nux Vomica per cwt	R2·00 to 3·50	
Croton Seed per cwt	R20·00 to 22·00	
Kapok cleaned f o b per cwt	R24·00	
do uncleaned do	R5·50	
Plumbago per ton, according to grade — Large lumps	R300·00 to 700·00	
Plumbago per ton, according to grade — Ordinary size lumps	R250·00 to 625·00	
Plumbago per ton, according to grade — Chips	R150·00 to 450·00	
Plumbago per ton, according to grade — Dust	R75·00 to 300·00	

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce.)

EXPORTS.

Colombo, 1st Oct. 1900.

CARDAMOMS:—
All round parcel, well bleached per lb. R1·40
Do. dull medium do. 1·20
Special assortment, 0 and 1 only do. 1·70
Seeds do. 1·30

CINCHONA BARK:—
Per unit of Sulphate of Quinine 10c—For 1½ to 3 o/o

CINNAMON :—
Ordinary assortment per lb. 59c.
Nos. 1 and 2 only per lb. 63c.
Nos. 3 and 4 only per lb. 54c.

CINNAMON CHIPS :—
Per candy of 560 lb R95·00

COCOA :—
Finest estate red ; unpicked per cwt R50·00
Medium do do ,, none
Bright native, unpicked and undried ,, none
Nominal. None offering.
Ordinary do do do ,, none

COCONUTS—(husked).
Selected per thousand R48·00
Ordinary ,, R39·00
Smalls ,, R30·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R80·00
Do in bags none.

COCONUT (Desiccated).
Assorted all grades per lb. 13¾c

COCONUT OIL—
Dealers' Oil per cwt. R14·37
Coconut Oil in ordinary packages, f. o. b. per ton R322·50 Business done.

COFFEE.—
Plantation Estate Parchment on the spot per bus. R10·50.
Plantation Estate Coffee f.o.b. (ready) per cwt.—R55·00. Nominal. None offering.
Native Coffee, f.o.b per cwt.—None.

CITRONELLA OIL—
Ready do per lb. 65c.

COPRA—
Boat Copra per candy of 560 lb. R43·50
Calpentyn Copra do do R44·50
Cart do do do R41·00
Estate do do do R45·00

CROTON SEED per cwt R22·00

EBONY—
Sound per ton at Govt. depot—R205.
Inferior R155. As per Govt. sales of 3rd Sept.

FIBRES—
Coconut Bristle No 1 per cwt R10·50
Do ,, 2 ,, none
Do mattress ,, 1 ,, 4·00
Do ,, 2 ,, 3·00
Coir Yarn, Kogalla ,, 1 to 8 18·00
Do Colombo ,, 1 to 8 16·00
Kitool all sizes 38·00
Palmyrah 16·00

PEPPER—Black per lb 28c.

PLUMBAGO—
Large lumps per ton R700
Ordinary lumps do 625
Chips do 450
Dust do 300
Do (Flying) 125

SAPANWOOD— per ton R52·50

SATINWOOD (ordinary) per cubic ft. R2·50

TEA—	High Grown Average. cts	Medium Average. cts	Low Grown Average. cts
Broken Pekoe and Broken Orange Pekoe per lb	—	—	—
Orange Pekoe do	—	—	—
Pekoe do	—	—	—
Pekoe Souchong do	—	—	—
Pekoe Fannings do	—	—	—
Broken mixed, dust, &c. per lb	—	—	—

No sales.

CEYLON EXPORTS AND DITRIBUTIONS FOR SEASONS 1899 AND 1900.

COUNTRIES	Tea. 1900 lbs.	Tea. 1899 lbs.	Coffee—cwt. Plantation	Coffee—cwt. N'tive	Coffee—cwt. Total.	Cocoa cwts.	C'moms lbs.	Cinnamon. Bales lbs.	Cinnamon. Chips. lbs.	Coconut Oil. 1900 cwt	Coconut Oil. 1899 cwts	Copra cwts.	Desiccated Coconut lb.	Poonac cwts.	Coconuts. No.	Plumbago. 1900 cwts.	Plumbago. 1899 cwts.	Fibre.	Ebony cwts.
To U K. ..	84375947	76887609	6050	..	6050	18021	262900	618163	195682	168391	112485	15522	6100803	..	8388630	87483	135521	39718	280
,, Austria ..	11152	7491	..	..	..	..	..	1500	19600	7281	2064	25742	75470	...	..	2	14	...	..
,, Belgium ...	12455	12349	70	..	70	417	...	68769	92286	1326	1602	56878	356934	64976	...	27123	32714	13969	...
,, France ..	199899	76014	68	...	68	78	3407	88988	41786	...	...	22140	17902	201	..	102	814	400	220
,, Germany ..	267616	289578	350	..	350	380	62970	419877	381021	10373	6542	51105	843311	58027	603009	40006	63010	11432	2045
,, Holland ..	2000	22874	..	..	..	...	...	5000	88168	..	..	..	123530	..	25050	912	5776	440	...
,, Italy ..	5032	11991	..	..	..	...	519	119600	116480	..	404	1500	..	..	5011	..	..	..	45
,, Russia ..	6584343	2719244	128	..	128	..	..	..	...	..	..	51034	..	...	1590	1004	1188	...	..
,, Spain ..	15130	13800	..	...	..	...	..	162500	42000	..	..	..	...	...	..	..	...	..	..
,, Sweden ..	52743	47244	9	..	9	..	4051	2400	..	...	206	4403	...	..	..	105	307	...	...
,, Turkey ..	22202	15230	..	..	..	..	2120	...	10	...	..	1	...	..	2000	...	..	..	...
,, India ..	583090	417300	169	4	173	...	43545	500	..	57645	47850	146	...	..	218050	1045	435	120	..
,, Australia ..	12525799	12222006	2280	..	2280	39	336	8840	19596	634	720	..	528612	42	..	1999	759	3360	27
,, America ..	3502286	2219553	135	..	135	561	2641	229000	120400	44802	72640	..	1211750	...	..	108630	223169	6193	..
,, Africa ..	150496	231088	16	..	16	..	2315	10100	2408	42	..	..	25770	...	1296333	..	..	1907	..
,, China ..	935252	959257	24	...	24	82	1800	67400	...	827	3184	20	83555	...	..	41	127	...	..
,, Singapore ..	80890	50322	1	..	1	675	1340	..	..	2427	22333	..	...	..	—	...	..	42	...
,, Mauritius ..	700	73701	..	..	..	..	...	...	..	..	..	...	...	..	...	..	...	..	..
,, Malta ..	335573	223467	..	...	..	..	..	...	..	...	...	...	..	..	..	..	..	..	..
Total export from 1st Jan. to 1st Oct, 1900	109662605	96500118	9300	4	9304	20253	387944	1802637	1129437	293748	270030	228491	9367637	123246	10539673	268452	463834	77581	2617

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Prices Current, London, September 5th, 1900.)

	QUALITY.	QUOTATIONS.
ALOES, Soccotrine cwt.	Fair to fine dry ...	44s a 85s
Zanzibar & Hepatic ,,	Common to good ...	20s a 60s
ARROWROOT (Natal) lb.	Fair to fine ..	5½d a 6¼d
BEES' WAX, cwt.		
Zanzibar & Bombay White ,,	Good to fine	£6 a £7 10s
Zanzibar & Bombay Yellow ,,	Fair ,,	£6 10s a £6 15s
Madagascar ,,	Dark to good palish	£6 5s a £6 10s
CAMPHOR, China ,,	Fair average quality	187s 6d
Japan ,,	,, ,, ,,	190s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	2s 6d a 2s 9d
	Middling, stalky & lean	1s 5d a 1s 7d
Ceylon.—Mysore ,,	Fair to fine plump ..	1s 7d a 4s 2d
	Seeds .	1s 10d a 2s 4d
,, Tellicherry ,,	Good to fine ..	2s 11d a 3s
	Brownish ..	2s 6d
,, Long ,,	Shelly to good ..	2s 11d a 3s 6d
,, Mangalore ,,	Med brown to good bold	1s 10d a 3s 6d
CASTOR OIL, Calcutta ,,	1sts and 2nds ..	4d a 4½d
CHILLIES, Zanzibar cwt.	Dull to fine bright ...	37s 6d a 47s 6d
CINCHONA BARK.— lb. Ceylon	Ledgeriana Orig. Stem	3¾d a 6¾d
	Crown, Renewed	5d a 7d
	Org. Stem	3¾d a 5½d
	Red Org. Stem	4⅜d a 5⅝d
	Renewed	5¾d a 7½d
	Root	3¾d a 4d
CINNAMON, Ceylon 1sts per lb.	Ordinary to fine quill	11d a 1s 8d
2nds	,, ,,	10d a 1s 7d
3rds	,, ,,	9½d a 1s 6d
4ths	,, ,,	8½d a 11½d
Chips	,, ,,	3½d a 9d
CLOVES, Penang lb.	Dull to fine bright bold	5½d a 9d
Amboyna ..	Dull to fine	4½d a 5½d
Zanzibar and Pemba	Good and fine bright	3⅞d a 4d
	Common dull to fair	3⅜d a 3¾d
Stems ..	Fair	1½d
COFFEE		
Ceylon Plantation ,,	Bold to fine bold colory	100s a 117s
	Middling to fine mid ...	85s a 95s
	Low mid. and low grown	75s a 82s 6d
	Smalls	55s a 75s
Native	Good ordinary	30s a 70s
Liberian ,,	Small to bold	37s a 45s
COCOA, Ceylon ,,	Bold to fine bold	90s a 105s
	Medium and fair	82s a 90s
	Native	72s a 80s
COLOMBO ROOT ,,	Middling to good	12s a 20s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair ..	£14 a £19
FIBRE, Brush ,,	Ord. to fine long straight	£16 a £19
Cochin ,,	Ordinary to good clean	£18 a £24
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £33
Cochin ,,	,, ,, very fine	£12 a £32
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	30s a 40s
CUTCH ,, ,,	Fair to fine dry	23s a 35s
GINGER, Bengal, rough ,,	Fair	28s 6d
Calicut, Cut A ,,	Good to fine bold	75s a 85s
B & C ,,	Small and medium	35s a 72s 6d
Cochin Rough ,,	Common to fine bold	25s a 33s
	Small and D's	25s a 28s
Japan ,,	Unsplit	24s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	20s a 45s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £20
	Part yellow and mixed	£8 2/6 a £10 10s
	Bean and Pea size ditto	70s a £9 2/6
	Amber and dk. red bold	£5 10s a £7 10s
	Med. & bold glassy sorts	80s a 100s
Madagascar ,,	Fair to good palish ...	£4 8s a £8
	,, ,, red ...	£4 5s a £9
ARABIC E. I. & Aden ,,	Ordinary to good pale	35s a 60s
Turkey sorts ,,		67s 6d a 85s
Ghatti ,,	Pickings to fine pale ...	12s 6d a 35s
Kurrachee ,,	Good and fine pale ...	52s 6d a 55s
	Reddish to pale selected	30s a 40s
Madras ,,	Dark to fine pale ...	23s a 35s
ASSAFŒTIDA ,,	Clean fr. to gd. almonds	40s a 85s
	Ord. stony and blocky	6s a 25s
KINO ,,	Fine bright	1s a 1s 3d
MYRRH, picked ,,	Fair to fine pale	65s a 75s
Aden sorts ,,	Middling to good	33s a 55s
OLIBANUM, drop ,,	Good to fine white	35s 6d a 50s
	Middling to fair	25s a 35s
pickings ,,	Low to good pale	17s a 20s
siftings ,,	Slightly foul to fine	16s 6d a 18s
INDIARUBBER, Assam lb	Good to fine	2s 10½d a 3s 2¾d
	Common to foul & mxd.	1s 4d a 2s 6d
Rangoon	Fair to good clean ...	2s 3d a 3s 3d
Borneo	Common to fine	1s a 2s 4d

	QUALITY.	QUOTATIONS.
INDIARUBBER, *(Contd)*.		
Java, Sing. & Penang lb.	Foul to good clean ..	8d a 3s 3d
Mozambique ,,	Good to fine Ball ...	2s 8d a 3s 6d
	Ordinary to fair Ball..	2s a 2s 10¾d
	Low sandy Ball ..	1s 3d a 1s 7d
	Sausage, fair to good..	2s 6d a 3s 3d
	Liver and livery Ball .	2s 4d a 3s 1½d
Nyassaland ..	Fair to fine ball .	3s 1d a 3s 2¾d
Madagascar ,,	Fr. to fine pinky & white	3s a 3s 3d
	Fair to good black .	2s a 2s 10¾d
	Niggers, low to fine ..	11d a 2s 8d
INDIGO, E.I. ,,	Bengal—	
	Shipping mid to gd violet	3s 7d a 4s 6d
	Consuming mid. to gd.	3s a 3s 6d
	Ordinary to mid.	2s 9d a 3s 3d
	Mid. to good Kurpah	2s 4d a 3s
	Low to ordinary	2s a 2s 3d
	Mid. to good Madras	1s 7d a 2s 6d
MACE, Bombay & Penang per lb.	Pale reddish to fine	2s a 3s
	Ordinary to fair	1s 4d a 1s 11d
	Pickings	1s 4d a 1s 4½d
MYRABOLANS, Madras cwt	Dark to fine pale UG	6s a 7s
	Fair Coast	5s 6d a 6s
Bombay ,,	Jubblepore	4s 3d a 7s
	Bhimlies	4s 9d a 9s 6d
	Rhajpore, &c.	4s 3d a 8s
Bengal ,,	Calcutta	4s 6d a 6s
NUTMEGS— lb.	64's to 57's	2s 4d a 2s 6d
Bombay & Penang ,,	110's to 65's	11¼d a 2s 3d
	160's to 130's	6d a 11d
NUTS, ARECA cwt.	Ordinary to fair fresh	15s a 17s
NUX VOMICA, Bombay per cwt.	Ordinary to middling	4s a 5s 6d
Madras	Fair to good bold fresh	7s a 10s
	Small ordinary and fair	5s 6d
OIL OF ANISEED lb	Fair merchantable	6s 5d
CASSIA ,,	According to analysis	3s 8d a 4s
LEMONGRASS ,,	Good flavour & colour	3d
NUTMEG ,,	Dingy to white	3d a 3½d
CINNAMON ,,	Ordinary to fair sweet	3¼d a 1s 6d
CITRONELLE ,,	Bright & good flavour	11d a 1/0½d
ORCHELLA WEED—cwt		
Ceylon ,,	Mid. to fine not woody...	10s a 12s 6d
Zanzibar. ,,	Picked clean flat leaf ...	10s a 16s
	,, wiry Mozambique	10s a 11s
PEPPER—(Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ...	6¼d a 6⅜d
Singapore ...	Fair	6 5-16d a 6⅜d
Acheen & W. C. Penang	Dull to fine	5¾d a 6¼d
PLUMBAGO, lump cwt.	Fair to fine bright bold	35s a 40s
	Middling to good small	20s a 32s
chips ,,	Dull to fine bright ..	10s a 20s
dust ,,	Ordinary to fine bright	4s a 11s
SAFFLOWER ,,	Good to fine pinky ..	65s a 75s
	Inferior to fair ..	40s a 60s
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour ..	£20 a £50
Chips ,,	... ...	5s a £8
Madras, Logs ,,	Fair to good flavour ..	£20 a £50
Chips ,,	Inferior to fine ...	£4 a £8
SAPANWOOD Ceylon ,,	Fair to good ..	£5 a £5 10s
Manila ,,	Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth...	£7
SEEDLAC cwt.	Ord. dusty to gd. soluble	53s a 59
SENNA, Tinnevelly lb.	Good to fine bold green	5d a 8d
	Fair middling medium	4d a 5¼d
	Common dark and small	1¼d a 3½d
SHELLS, M. o'PEARL—		
Bombay cwt.	Bold and A's / D's and B's / Small ...	£4 5s a £5 7s 6d
Mergui ,,	Small to bold ..	£5 12/6 a £7 10s
Mussel ,,	Small to bold ...	18s a £2 10s
TAMARINDS, Calcutta... per cwt.	Mid. to fine bl'k not stony	15s a 16s
Madras	Stony and inferior ..	7s 6d a 11s
TORTOISESHELL—		
Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	17s a 24s
TURMERIC, Bengal cwt.	Fair ...	28s nom.
Madras ,,	Finger fair to fine bold bright	25s a 27s 6d
Do. ,,	Bulbs ..	20s a 21s
Cochin ,,	Finger ..	24s
	Bulbs ...	7s 6d
VANILLOES— lb.		
Mauritius ... 1sts	Gd. crysallized 3½ a 9 in	17s 6d a 27s
Bourbon ... 2nds	Foxy & reddish 4½ a 8 ,,	15s a 22s
Seychelles 3rds	Lean and inferior ...	10s a 13s 6d
VERMILION lb.	Fine, pure, bright ...	3s 3d
WAX, Japan, squares cwt	Good white hard ...	35s a 36s

THE

AGRICULTURAL MAGAZINE,

COLOMBO.

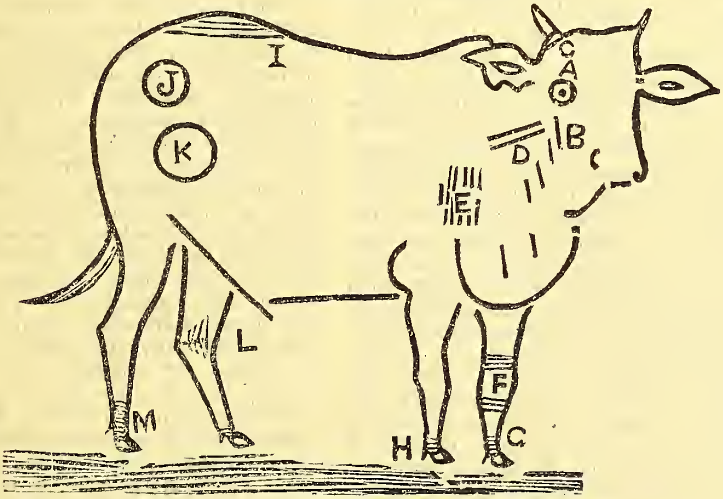
Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for October:—

Vol. XII.] OCTOBER, 1900. [No. 4.

THE BRANDING OF CATTLE.

(Continued from last number.)



A. Round eye.

B. On cheek.

C. Rouud root of horn.

D. On neck.

E. On shoulder.

F. Round knee.

G. Round fetlock.

H. About suffraginous boues.

I. Loins

J. Point of hip.

K. On round bone.

L. On hock.

M. Hind fetlock, suffraginous bones and coronet.

The common method of branding cattle in this country—by which a great part of the body is covered with letters, figures, designs and diagrams—tends, so to speak, to deaden the skin, so that its physiological functions are seriously interfered with. What our village cattle keepers have to be taught is that it is not the immoderate use of the firing iron, or even of drugs, that induce's cattle to develope and put on flesh, or impart strength to them; but that it is the food and the care bestowed on them. I shall now go on to consider the second division of my subject, viz., branding for identification. In Ceylon there is no system adopted by cattle-owners, nor are there any regulations specified by the State, in regard to branding for identification. As a rule, the letters branded for identification are of unnecessarily large size, and it is not uncommonly the case that the initials of the owner's name practically cover the entire side of the animal's body. In some countries there are special regulations as to the places where branding for identification might be done. I am inclined to think that the best places for marking is the croop or the thigh, and that no letters need occupy more than three square inches. I have heard it suggested that animals should be branded ou the neck, close behind the ear, as this does least injury to the hides. But I am not inclined to sanction this, particularly when the branding is done by the ordinary village hand, as the spot indicated is too delicate—I almost said vital—to be subjected to the action of a hot-iron, particularly when this instrument is carelessly handled. I quite see the force of the remark that hides are damaged by branding, but at the same time I cannot abandon my recommendation made from a veterinary point of view to suit commercial ideas. I would, however, avail myself of these ideas to enforce my objection against indiscriminate and immoderate use of the firing iron, since the more it is used the greater is the damage done to hides and the lower the prices they fetch. Many other devices have been conceived for superceding the firing iron in marking for identification, such as ear-marking, tatooing, and branding with chemical solutions, but when we consider the circumstances of the mass of the Island population, it is not to be hoped that any of these devices can either be recommended or enforced. I do not think that branding with the hot iron could be superceded as a convenient and satisfactory method of marking for identification, but what is necessary is that such branding should be limited by certain regulations, which should be enforced through the ordinary administrative channels, so that while the cattle-owner marks his cattle in a manner and to a degree sufficient for purposes of identification he does not cause unnecessary suffering to the beast, nor damage the prospective value of its hide.

A. CHINNIAH.

(*To be concluded.*)

[*Erratum.*—For "opening parotid," in line 19 of the first part appearing in the September number, read "open parotid."]

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF SEPTEMBER, 1900.

1	Saturday ..	3·87	17	Monday ..	Nil
2	Sunday ..	·45	18	Tuesday ..	Nil
3	Monday ..	·42	19	Wednesday...	Nil
4	Tuesday ..	·45	20	Thursday ..	·12
5	Wednesday...	·03	21	Friday ..	Nil
6	Thursday ..	·50	22	Saturday ..	Nil
7	Friday ..	·45	23	Sunday ..	Nil
8	Saturday ..	Nil	24	Monday ..	Nil
9	Sunday ..	·04	25	Tuesday ..	Nil
10	Monday ..	Nil	26	Wednesday...	Nil
11	Tuesday ..	Nil	27	Thursday ..	Nil
12	Wednesday...	·37	28	Friday ..	Nil
13	Thursday ..	·07	29	Saturday ..	Nil
14	Friday ..	·65	30	Sunday ..	Nil
15	Saturday ..	Nil	1	Monday ...	·57
16	Sunday ..	Nil			
				Total..	7·12
				Mean..	·22

Greatest amount of rainfall in any 24 hours on the 1st Sept., 3·87 inches.

Recorded by Mr. C. Drieberg.

OCCASIONAL NOTES.

A correspondent, who is evidently interested in tropical drug plants, for which we know there is some enquiry from Europe, sends us a list of plants and asks us for the Sinhalese names. We give below a note on each of the plants named: 1. *Michelia champaca*, Champak, Sapu. 2. Sweet Basil, *Ocinium basilicum*, Suvandatala. 3. *Tinosporae.* There are three indigenous species of Tinospora: *T. malabarica.* var. Tomentosa, Bukinda, Walkinda; *T. crispa*, Tittakinda; *T. cordifolia*, Rasakinda. 4. *Wrightia antidysenterica*, now *Hollarrhena antidysenterica* is Kenchi a Conessi bark of commerce. It is not indigenous and has no native name. A close ally is *Hollarrhena mitis*, Kiriwalla or Kirimawara, is found native, and the bark is much used medicinally for fever and dysentry. Dr. Trimen states that the bark is sold under the name of "Kalinda." 5. *Emblica officinalis*, now *Phyllanthus emblica*, the *Emblic myrobalan*, Nelli. 6. *Saraca indica*, Diyatalmal or Diyaratambala. 7. *Abroma augusta*, "abrome," not indigeuous and no native name. 8. *Nigella indica*, now Nigella sativa, small fennel or black cummin, Kaluduru. 9. *Trapa bispinosa*, Ikiliya. 10. Aloes, the drug is the product chiefly of *Aloe vulgaris*, not indigenous, no native name. 11. Neem, Margosa or Kohomba, *Azadirachta indica.* 12. Sepalika, this is the native name of *Nyctanthes arbortristis.*

A correspondent signing himself Robert Thompsou has addressed a letter to the Secretary of State for India on the subject of Cacao Cultivation, which from the writer's experience of cacao he is led to believe will succeed in certain parts of the Empire. Mr. Thompson has seeu cacao grown successfully under irrigation ou vast areas where the rainfall is very meagre, and he is sanguine that the same can be done in parts of India if the trees are grown under "shade." Refering to past

failures in the attempt to establish cacao gardens in India, Mr. Thompson says that notwithstanding the abortive attempts referred to, there can be little doubt that in Southern India numerous sites could be selected for the establishment of plantations of this important product.

There is perhaps no plant more peculiar in its relation to soil, temperature, rainfall, aspect and such natural conditions than is cacao, as witness the very restricted area in Ceylon in which cacao flourishes. However, we sincerely hope Mr. Thompson is right in his conjecture, which coming from a man of his experience is worthy the notice of the Imperial authorities, and we thrust that a fair trial will be given by the Indian government to cacao culture under the conditions indicated by the writer in question.

The Superintendent of the Calcutta Botanic Gardens, referring to Rhea, mentions in his report that a machine which is said to meet all requirements, and which certainly meets the needs of Rhea growers better than any hitherto offered, has now been put upon the market, and its advent appears likely to give a fresh inpetus to rhea cultivation. It is a pity the machine in question is not more definitely referred to, for there are a number of people in Ceylon possessing stocks of rhea, who would be glad to have further particulars.

Dr. Reginald Ashe, the Superintendent of the Jail at Mymensing, has lately used with much success, in the treatment of diarrhœa and dysentery, flour made from the plantain. Any variety of plantain, he informs the *Indian Medical Gazette*, will do, but the *kutch kala (musa sapientum)* from its size is the best to use. The plantains are cut just before ripening, they are skinned with a sharp wooden knife, so as to avoid blackening, then cut into thin slices, sun dried, pounded in a mortar, and sifted through muslin. The fine powder or flour should be stored in air-tight glass bottles. The issue is 2 oz. for each meal, cooked in a brass vessel with a little water. *Dahi*, or butter milk, can afterwards be added. The taste of the plantain powder is slightly astringent, but fruity and palatable.

In the last published report on the Department of Agriculture, Bombay, the following occurs under the head of Agricultural Education:—As a step towards reviving the agricultural classes which were languishing for want of students, the scholarships attached to the classes have been reduced in number and raised in value. The University have recently agreed to the conversion of the diploma in Agriculture into a degree, and Government have also been pleased to direct that the licentiates of Agriculture should have a preferential claim to District Inspectorships of Agriculture before other officials of the Revenue Department or those of the Survey Department who do not know English, and that they should also be placed on the same footing as licentiates of Civil Engineering for admission to the Forest Department, provided they undergo the special course of training in forest subjects and pass the same tests in those subjects.

The same report, under the head of cattle disease, gives the following interesting statement showing the percentage of deaths from Rinderpest and Foot and Mouth disease in the Bombay Presidency. Rinderpest—attacks 1,220, percentage of deaths 68·85; Foot and Mouth disease—attacks 2,679, percentage of deaths 4·23. It is remarked that this shows a decease in the number of attacks as well as in the percentage of deaths.

PROFESSOR ROBERT WALLACE.

After a considerable interval of time we have had the pleasure of hearing from the Professor of Agriculture at Edinburgh University, who has always taken a keen interest in Tropical Agriculture, while he has already visited Ceylon three times in the course of his travels to India and the Australian Colonies. Professor Wallace, who is possessed of remarkable energy and great power of observation, has made it a point of studying the agriculture of the British possessions on the spot. His first visit was to Canada, and later on he traversed India, Australia, and the Cape, dealing with the agriculture of each of these countries in a book or pamphlet, or a course of lectures. In the letter received by last mail, he writes:—

"I am now busy writing my new Indian lectures, and find the work most interesting. Of course I include Ceylon in my new course, and anything of importance you think should be noted, I shall be glad if you will let me know. I may go out again some day to Australia, so there is a more or less remote chance of my looking in upon you. My brother from Egypt (where he is Director of Agriculture) who is staying here (Thornhill, Dumfriesshire) has just returned after a trip 'round the world,' but went by Japan instead of your way."

Professor Wallace encloses a syllabus (issued as a supplement to the *Edinburgh University Calendar*) of the new course: The Garton lectures on Colonial and Indian Agriculture. The course is dealt with in the following manner: Section 1. (Session 1900-1901, 20 lectures) India and Ceylon, Egypt, South Africa. Section 2. (Session 1901-1902, 20 lectures). The Dominion of Canada, Australasia, the smaller Crown Colonies (West Indian Islands, British Guiana, the Straits Settlements, Uganda, and other African Continental possessions and Islands; Islands in the South Atlantic and Pacific Oceans.) The agriculture of India and Ceylon is treated of, under the following heads, which are again divided into a large number of subheads: Introduction, Tillage Implements, Cultivation of Crops, Irrigation, Manures and Live Stock. As showing the interest which the Professor still takes in the East, we reproduce, on another page, a letter written by him to the *Scotsman* on the subject of Indian Forestry. Query: Is the Ceylon Forest Department more considerate of the Forest rights of the natives?

CEYLON TIMBERS.

Still another Report on the specimens of timber sent from Ceylon to the Imperial Institute has reached us. We have already referred to the Report of Professor Unwin; the present report is by Mr. Herbert Stone, F.L.S., one of the expert referees of the Imperial Institute.

Mr. Stone, at the outset of his report, states—and gives good reasons to support the statement—that there is but a poor chance of our Colonial timbers competing with English woods, unless they present some peculiar merits. The exceptions are those timbers which in some way resemble English staple timbers and which will pass under the same name. Three examples are Suriya-Mara (*Albizzia odoratissima*) Halmilla (*Berrya ammonilla*) and Lunumidella (*Melia dubia*). These, if imported respectively as "Ceylon rosewood," "Ceylon Satinwood" and "Ceylon Cedar," would, it is expected, with the help of assiduous advertisement, readily be bought on trial, and probably be adopted for many purposes. Unless such a plan (which Mr. Stone hastens to assure us, is no deception, from a trade point of view) is adopted, only one out of the nineteen specimens of Ceylon woods examined has any chance of gaining a footing in England.

Mr. Stone writes short but interesting notes on the following timbers:—

Michelia champaca, Sapu, S; Sanpakam, T.
Pleurostylia Wightii, Piyari, S; Panakka, T.
Calophyllum Burmanii, Gurukina, S; Chiru-punnai, T.
Pterospermum suberifolium, Velanga, S; Toddi, Vinnaku, T.
Vitex altissmia, Milla, Milila, or Sapu-milila, S. Mailai Kata-manaku, T.
Zizyphus jujuba, Masan, Maha-debara, S; Ilanthai, T.
Vatica Roxburghiana, Mendora, S.
Carallia calycina, Ubberiya, S.
Cryptocarya membranacea, Tawenna, S.
Carallia integerrima, Dawata, S.
Azadriachta indica, Kohomba, S; Vempu, T.
Melia dubia, Lunumidella, S; Malai-Vempu, Patiri, T.
Alseodaphne (Persea) semicarpifolia, Wewarani, S. Ranai, Yavaranai, T.
Heritiera littoralis, Etuna, S; Chomuntiri, T.
Thespesia populnea, Suriya, S; Pu-varasu, T.
Berrya ammonilla, Halmilla, S; Chamandale, Male Kuda-munakku, T.
Albizzia odoratissima, Suriya-Mara, S; Karuvakai, T.
Preicopsis mooniana, Nedun, S.

Presumably it is the same collection, consisting of twenty-two specimens, which was submitted both to Professor Unwin and Mr. Stone for report. Of these twenty-two, the present report deals with nineteen, those not dealt with being *Calophyllum bracteatum*, Walukina, S., *Artocarpus integrifolia*, Kos, S., Pila T., and *Artocarpus nobilis*, Del, Waldel, S. Why such common building timbers as the two latter have been left out is not stated. It is a pity that a number of errors in nomenclature has crept into both Professor Unwin's and Mr. Stone's reports—particularly as regards native names. To give an instance, one specimen is referred to as Vuinaka and is said to have been marked Vincol. In order to identify the wood the specimen was sent to Kew, but the name could not have been found in its corrupted form in any of the lists. It is most probable, however, that the wood referred to was *Pterospermum suberifolium*, and we so give it in the above list in which we have inserted all the Sinhalese and Tamil names as well. Again, one or two errors are likely to lead to great confusion,—for instance, Tawenna is given as *Dicopsis petiolaris* (now *Palaquium petiolare*, order Sapotaceae) instead of *Cryptocarya membranacea*, order Lauraceae). It is doubtful therefore which is the correct name of the specimen at the Imperial Institute, whether the Sinhalese or the botanical one.

As might be expected from his general remarks with reference to Ceylon timbers, Mr. Stone has not much to say in his notes in praise of our woods except in the cases already mentioned. Regarding Ubberiya, he says "this wood is the most beautiful of the series, resembling remarkably the most beautiful wainscoat oak in every direction of the grain. Apart from the reddish tinge, there are very few persons, even in the trade, who would not pronounce the wood to be oak." But even this beautiful wood has its drawbacks, since it does not darken with age, nor preserve its colour when polished.

In the note on Lunumidella, which, as stated above, Mr. Stone selected as a marketable timber, we read "to obtain the best effect of the grain, Lunumidella must be cut in the direction of the radius, *i.e.*, quartered, as the beautiful satin lustre does not appear in the tangential section." This is a hint—if the fact is not already known—which local timbermen and builders should take note of. The lightness of Lunumidella is said to be remarkable, and for this quality alone, says Mr. Stone, it should have a future before it. Suriya-mara, referred to as "the sweet-scented *mimosa*," (a name by the way we have never heard it called by) is perhaps best spoken of in the report. The timber is said to be a 'genuine rosewood,' the wood "extremely hard, even harder than Ebony." (Indian rosewoods are the product of *Dalbergia latifolia* and *D. sissoides.*) It is recommended that Suriya-mara should be allowed to season for at least two years before shipment, as the logs examined were found to be quite wet, though it is surmised that they must have been felled not less than eighteen months previously. This would lead us to suppose that the wood specimens reported on must have been a late contribution from Ceylon to the Imperial Institute collection, and not part of the original consignment of samples made some 8 or 9 years ago. Of Nedun, which is considered one of our best furniture woods, Mr. Stone has, strangely enough, very little to say in commendation.

We cannot help thinking that to be able to report to the best advantage, the timber expert should, in addition to the application of technical tests, examine timber not merely by means of hand or block specimens of doubtful age, but in the mass and even *in situ* before making deductions which are intended to have a practical and commercial bearing.* If, however, Mr. Stone has been the means of introducing three of our Ceylon woods to the notice of English timber dealers, we, and all who are interested in the development of the Island's resources, will have occasion to be grateful to him; but then it is a question whether the Island can spare, for purposes of export, any appreciable quantity of the three timbers which are said to have a future before them.

CLINICAL NOTES.

VASECTOMY.

On the 25th of August last I performed this operation on an Arab horse "Anthony." Instead of amputating the whole cord, I removed only about two inches of the *vas deferens*, more by way of experiment than for any other reason. I am glad to say that the operation was attended with no bad results, but in fact was as successful as could be desired, as the animal was able to be ridden on the 12th day after the operation.

The following was the *modus operandi*:—The animal was thrown down and secured in the usual way, but no chloroform was used. I began by making an antero-lateral section, with proper antiseptic treatment, on the off side of the scrotum along the line of the cord, and carefully dissected and took out the *vas deferens*, which was eventually severed and a piece about two inches in length removed. I fastened the wound with catgut ligature and covered it with antiseptic cotton wool and painted it over with colodion. The incision on the near side was postero-lateral, and made close to the groin. As a result there was slight bleeding from the scrotum. This wound was treated similarly to the first. The first wound was an exposed one and required to be protected from flies, but that on the near side did not give this trouble, though from its peculiar position it caused an awkward gait in the animal till it was perfectly healed. I however prefer the antero-lateral to the portero-lateral section.

The advantages of this operation over ordinary castration are: (1) It preserves the testicles, as a natural appendage of the horse. (2) It is less painful and cruel as no nerve is burnt, cut, or twisted. (3) The healing is quick, and in this, particular care was effected in what I consider to be the minimum time. (4) There is no liability to tetanus. (5) There is less chance of the growth of a schirrous cord. (6) There is little or no bleeding. (7) There is economy in the preservation of tissues which in the ordinary operation are cut or mutilated. Perhaps the only objection that could be brought against this operation is that it is apt to cause perplexity to the breeder, and even mislead him, as the presence of the testicles is apt to deceive him into the belief that an animal so operated on is still a stallion. A new term would be required for such horses, for the term gelding would not correctly describe them.

A. CHINNIAH,
Veterinary Surgeon

[*Erratum.*—In August number, under Clinical Notes, for "bracheal" read "median."]

THE GRAFTING OF THE MANGO.

In Ceylon we only hear of grafted mangoes in the Northern Province where this system of propagation was taught the Jaffna Tamils by Mr. Dyke, a past Government Agent. whose name is still associated in the North with many useful measures for the improvement of Agriculture and Horticulture.

In the Bombay Presidency the common method of grafting in vogue is that known as inarching-or grafting by approach. It differs from graft, ing in that the scion is not removed from the parent until they are both firmly adherent. The operation is thus described in Dr. Nicholl's Tropical Agriculture: A branch of the parent having been selected about the same size as the stock, the bark and a portion of the wood are pared away to the extent of two or three inches, and they are then bound fast together, the bark of the wounds being accurately fitted, and grafting wax applied over all. It is usual to make tongues in the stock and the scion, so that one may fit into the other, but this is not really necessary, although it helps to prevent movement, which is always fatal to union.

On a visit to India some years ago the writer saw this method of propagating the mango extensively practised in the neighbourhood of Bombay. It would appear, however, that there is another method of grafting even simpler and more sure than inarching, which we think is worth a trial by all growers of the mango in Ceylon. Mr. Horace Knight, writing to the *Queensland Agricultural Journal*, says that after long and close observation and numerous experiments, he has arrived at the conclusion that no other tree is simpler to graft according to this new method, and that the work can be done at any time, though it is best done when there is an upward flow of sap. He then goes on to describe the process which he has adopted and finds so successful, namely, that in which the bark only is used without any adhering wood. The process is in fact more akin to budding than to true grafting, since the grafts are simply pieces of bark, which though they have no growth on them, contain dormant eyes or buds. The size of the pieces of bark may vary according to the size of the trunk or branch on which they are to be grafted, but the most convenient proportional dimensions are said to be length twice the breadth, and if the pieces are taken off from places where rings occur, there will as a rule be found two or three latent buds in the pieces. The bark may be taken off either old or young trees, but the older bark is more easily removed and handier to trim into shape. In carrying out this method of grafting the first thing to be done is to cut out the section for inserting upon the host. Should the edges of the piece cut out be bruised or torn, cut the injured parts away till sound healthy bark only remains. Now press the piece firmly over the spot on the host where the piece is intended to grow, and make a clean cut into the bark of the host all round the piece and of the shape of the piece. Next take out the bark on the host which has been cut into and put the prepared section in its place. Do not make it fit so tightly that it has to be squeezed in, but make it a nice fit. Now bind it on with ordinary candle cotton, or other convenient material, with just sufficient pressure to make it touch the underlying tissues of the host, avoiding, if possible, binding over the buds. Clay or grafting wax is not required, as is commonly supposed, to keep out air and so effect a union. It may happen that the prepared piece of bark is thicker

than the bark of the host; but even in such a case if carefully applied and tied on, union will follow. If the weather be hot and dry the leafage above the graft may be left for shade, but should be ringbarked 6 or 8 inches above the graft. In two or three weeks' time the upper growth of the host may be removed by cutting at the point where it was ringbarked. If at the same time the buds on the graft are found to have started into growth, the binding may be removed. All young shoots except those on the graft must be rubbed off as soon as they appear. In favourable weather on the other hand the host could be deprived of its leaves and the majority of its branches. At this stage, the tree, being highly impregnated with sap, will take kindly to the piece of foreign bark that is inserted into its own bark and bring about union without delay.

MYRISTICA KINO.

Agricultural Ledger, No. 5, of 1900, deals with Kino obtained from the so-called wild nutmegs (Myristica, sp.) Kino, as obtained from the barks of trees, is of two kinds: Malabar Kino, which is the best, is got from *Pterocarpus marsupium.* This tree, which is indigenous to Ceylon, is known by the Sinhalese as Gamalu, and in Tamil as Venkai. Trimen, in his Flora, records the fact that a red gum-resin exudes from the bark and is used medicinally, also that it affords a fine timber, very hard and heavy, dark reddish brown, durable and containing a red resin. The other kind, called Bengal Kino, is the product of *Butea frondosa*, also indigenous to the Island, and known in Sinhalese and Tamil respectively as Gaskela and Parasu. Dr. Trimen says of it: "A dark red astringent juice exudes from the bark, which hardens into a brittle ruby-coloured resinous-looking gum, the Bengal kino of commerce." The wood is described as soft, light, and not durable.

These gums are used largely in medicine as astringents, the former having been for long an official drug in the British and American pharmacopœias.

Some four years ago Dr. Edward Schaer, Professor of Pharmacology in Strasburg wrote a paper on a new kino from Myristica, after examination of an extract handed to him by Dr. Warburg of Berlin who had received it from the Director of Kew. The specimen was obtained from *Myristica malabarica*, and was like the official kino in appearance.

Professor Schaer succeeded in obtaining from Buitenzorg further specimens of products of other wild nutmeg trees. In each of these he found a crystalline deposit which distinguished them from the kino from other sources. This deposit was determined as *Calcium tartrate*—a conclusion of some interest in vegetable physiology as inorganic crystals peculiar to plants have hitherto been traced to *Calcium oxalate*, sulphate, phosphate and carbonate.

Dr. Schaer summed up the result of his investigation as follows:—The dried juice of several Asiatic species of Myristica (*e.g.*, *M. malabarica*, *M. fragrans*) as regards appearance and physical qualities, show but little difference from Malabar Kino. 2. This substance which may be termed "*Myristica kino*" agrees in the chemical reactions due to their constituents in all important points, with the kino of *Pterocarpus marsupium.* It can therefore be stated that drugs of a very similar character, and partly of close resemblance to official kino, are to be found in the families Leguminosæ (*Butea*, *Pterocarpus*, *Milletia*), Saxafragaceæ (*Ceropetalum*), Myrtaceæ (*Eucalyptus*, *Angophora*) and Myristicaceæ.

3. Myristica Kino differs as far as can be observed, from the *Pterocarpus kino*, and probably also from Butea and Eucalyptus kino, by containing in the crude state of the inspissated fresh juice, smaller or larger amounts of a distinctly crystalline calcuim salt, viz., calcium tartrate, suspended in, and depositing from the liquid juice. By this characteristic admixture it can be easily distinguished from the official kino and probably also from other kinds of commerce."

There is no doubt that the property of secreting this so-called "Kino" is possessed by nearly all species of Myristica; indeed, Kurz in his "Forest Flora of British India," remarks that one of the features of this genus is that the bark "abounds in an acrid juice which is viscid and stains red." *M. longifolia* is said by Dr. Watt to exude a red resin, while *M. gibbosa* and *M. Kingii* (both Indian trees) also yield gum resins which can be evaporated into a kino-like substance, particularly the former, of which it is said that the evaporation of the clear juice gave a kino which was almost indistinguishable from commercial specimens of Malabar kino.

In Ceylon we have four indigenous species of Myristica. *M. horsfieldia*, the Sinhalese "Ruk' is well-known for its wood which is used for boat-making (the flowers of which have the characteristic odour of sandalwood); *M. irya*, Sin. Irya; *M. zeylanica*, and *M. laurifolia*.

This last is the familiar "Malabodde" or "wild nutmeg" of Ceylon, the arilled fruits of which are very like the true spice fruit. The wood of this tree is light and sometimes used for tea-boxes, while Dr. Trimen mentions that an orange-red astringent gum exudes from the bark. Mr. T. F. Bourdillon, Conservator of Forests for Travancore also refers to *M. laurifolia* as secreting "a thin red juice" from its stem.

The report on Myristica Kino concludes thus: "If the fresh juice could be collected in any quantity from the wild nutmeg trees of India, and evaporated to dryness without much delay, the residue would be an admirable substitute for commercial kino." At present, however, there is no call for Kino from the new sources indicated, as there is enough of the commercial article produced by the forests of the west coast of India. Still it has been shown that such new supplies will be always available to be drawn upon whenever necessary.

CULTIVATION OF THE ARECANUT IN BOMBAY DISTRICT.

[A note by Mr. J. W. Mollison, Deputy Director of Agriculture, Poona.]

(*Continued.*)

The palms are raised in seed-beds and are once transplanted before they are planted out permanently. The first seed-bed is carefully prepared, the soil is dug, broken fine and mixed with leafmould. Fully matured nuts from old trees are specially selected for planting. These are planted about 9 inches apart, in April. The seed-bed should be kept thoroughly moist. The shoots appear in June. The seedlings are transplanted in October into any moist place in the garden or along the water-courses about 2 feet apart and remain thus until permanently transplanted. This permanent transplantation is usually done towards the end of the rains. In the following March the trees are manured with leaf manure and the manure is covered with fresh cut branchwood which is partially withered, but which retains the leaves. The object of placing a layer of small branches above the manure is to break the force of heavy rain. The rain soaks through the brushwood, moistens the manure, but does not carry it away as would be the case if it were uncovered or covered with soil or in any other ordinary way.

The betel-trees are manured as described every second year and come into bearing in ten years or so. The plantains are maintained for some years after the betel-palms are permanently planted, but in time are removed and the cardamoms are planted between the palms and on the stems of the latter pepper vines are trained.

The *bharan* gets more or less washed away during each monsoon and the channels more or less damaged. This to some extent is prevented if plantain leaves, dried grass, and other available rubbish is put on the surface. But despite any precautions, the *bharan* is more or less denuded. The earth from the pathway is therefore removed to repair the drainage channels, &c., and new Kogodali earth is brought in, in headloads from the cuttings which border the gardens and placed along the centre of the *bharans*. This renewal is necessary at least every third year. It is an expensive operation, but the excavation from the cuttings is done in a systematic manner, the area of the garden can be gradually extended. The trees in the first plantation of betel-palms generally stand wide apart, but as they grow other young trees are planted between them. A nursery is always maintained to provide young trees for this purpose and to replace those which die from time to time.

Betel-trees are known to fruit for thirty or forty years, and there is a popular belief that they sometimes propagate much longer. On an average each tree has two bunches of fruit, sometimes three or four. But two good bunches yield as much as three or four inferior ones. The size of the bunches depends upon the manure used and upon the rainfall. A good bunch gives 200 to 300 nuts, and a specially good one about 400. with unfavourable rain or cloudy weather in April or May, many of the young nuts fall off and a smaller number of nuts on each bunch reach maturity. The trees produce flowers in March and April and the nuts are ripe in November or December, but to some extent the trees produce flowers and fruit out of season. Immediately below each bunch there is a frond, or leaf. It, with its sheath, remains attached to the tree for about two months after the inflorescense comes. Then these leaves fall to the ground. A few additional leaves fall during the monsoon. The sheaths of the leaves are a valuable product in the garden economy, they are used to provide hoods for protecting the bunches of betel nuts from the rain. If not protected the nuts rot. Two sheaths are used to make one hood.

The sheaths are skewered together to form a hood by means of thin pieces of split bamboo in a manner which is easy to demonstrate, but difficult to describe in writing. The hood is made adjustable in a very ingenious manner: and when it is bound round the bunch with thongs of plantain bast, it efficiently wards off rain.

The hoods are made and tied on by professionals who come from Mysore territory and below the ghats. A good workman can make 250 hoods per day and is paid Rs. 2 per 1000. This operation and tying them on carts at contract rates Rs. 10 to Rs. 12 per 1000 bunches and 2 meals per day, the men do not ascend and descend each tree, when once they have climbed up, they by means of slight exertion swing the tree and deftly catch hold of another and rarely descend to the ground for hours. The expert climbers who gather the fruit by cutting the bunches from the stem, getting Rs. 4 per 1000 bunches and three meals per day. Some garden owners or their regular servants are experts in making hoods, in adjusting them, and in climbing the trees. It is extremely interesting to note the manner in which the work is done. The climbing in the fair season looks extremely simple and easy to an onlooker, but in the monsoon with falling rain the tall smooth stems are slippery and the ascending process is much more difficult. The climber first ties his feet together round the insteps with strongbands, stripped from the sheath and leaves of the betel palm: this helps him to grip the stem with his feet. He carries with him strung round the neck a wooden rest on which to sit when he gets to the top. This rest is shaped like a two armed pick, and through a hole which corresponds to the shaft hole of a pick, a rope is passed and spliced, so that it is endless, when the fruit is reached the rest is unstrung and attached to the tree. The double end of the rope is passed round the stem and is long enough to pass over the two prongs of the rest, and when drawn tight secures the rest to the tree. It does not slip down, because the circumference of the stem increases downwards and the rings in the tree offer obstruction

to sliding and slipping. The operator sits resting one thigh on each wing of the rest and one hand at least is comparatively free to fix the hood over the bunch of nuts or to sever the bunch, when ripe, from the stem. The bunches when ripe are lowered to the ground by being slung to a rope over which they ride. Any one who has seen a bunch of betel-nuts can easily determine how the bunches are placed on the rope. They rapidly slide down and are caught by a man who holds the end of the rope at the ground. The stretched rope is held inclined at a considerable length from the tree.

(To be Concluded.)

ON THE FORESTS AND WASTE LANDS OF CEYLON.

By A. F. BROUN, ESQ.,
Conservator of Forests.
(Concluded.)

THE MOUNTAIN ZONE.—The forests of this zone form the cap of the island. It is from them that all the most important rivers take their rise, and for the preservation of water supply it is therefore necessary that they be preserved. The highest summits of the island, unless they are too rocky for tree growth, are covered with trees which form a continuous sheet from Pedro Peak to Hakgala, from thence to Totapela, and in a curved line to Kirigalpotta and Adam's Peak. The forests are found on both sides of the ridges, but the tea estates of Bogawantalawa and Maskeliya have encroached far up the slopes. It is not improbable that to these clearings is due to the silting up of the lower reaches of the Kelaniganga, and the consequent frequent inundations which are a plague in the low-country. A wise rule now prevails to allow no sale of Crown lands above 5,000 feet, and there are not many of these left between 4,000 and 5,000 feet. The general character of the forests of the mountain zone is the same as that of the dry country; the trees are flat topped, not generally very tall, and the undergrowth is not unlike in general appearance, the most characteristic are several species of *Eugenia, Calophyllum Walkerii, Michelia nilagirica, Gordonia zeylanica, Elaeocarpus obovatus, E. glandulifer, Meliosma pungens, Litsea* (5 species), *Rhododendron arboreum*, &c.

The undergrowth consists, especially above 5,000 feet, mostly of the numerous species of Strobilanthes which flower and die down every twelve years, and some of which reach a height of 20 feet and a girth of trunk of 12 inches. During the flowering time the forest is a blaze of colour, and swarms of bees, attracted to the flowers, produce abundance of honey, which has a peculiar flavour. When the seed ripens, thousands of jungle fowl suddenly appear wandering up from the low-country for the food, which they obtain abundantly.

Besides these plants, there are also large quantities of the little hill Bamboo (Arundinaria), species of *Coleus, Hedyotis*, and ferns, of which the most noticeable and characteristic is the handsome tree fern *Alsophila crinita*, which is found in moist places, in gullies, or on the face of moist rocky precipices. The stem of this occasionally attains a length of 40 feet. Among others the most interesting are *Lomaria Patersoni, Lastroea Beddomii, Leptogramme Totta, Osmunda javanica* (in sunny places near streams), *Diacalpe aspidioides, Doodia dives*, and *Marattia fraxinea*, the last being only found in the lower portion of zone, replacing *Angiopteris evecta*, which it closely resembles. The moisture in the atmosphere causes the branches and trunk of trees to be covered with epiphytic plants, such as numerous mosses, ferns, of which some *Hymenophyllums* closely resemble the mosses, and orchids, the most beautiful of which latter are *Dendrobium aureum, Cologyne odoratissima*, and *Eria bicolor*, and creeping plants such as *Piper, Medinilla fuchsioides*, &c. In this zone are found the strange *Balanaphoras*, which are found at higher elevations only within the tropics.

European genera are found mostly in this zone, but, on the whole, they occur chiefly in well-lit localities, or in patanas, and, excepting *Rhododendron arboreum*, the majority are shrubs or herbaceous plants, such are *Berberis, Cardamime, Viola, Hypericum, Rubus, Viburnum, Anaphalis, Lobelia, Campanula, Gentiana, Pedicularis, Drosera*, &c. Exceptions to this rule are *Impatiens*, of which there are numerous species, some extremely handsome, *Vaccinium* and *Ilex*, which all grow under shade.

This concludes my sketchof the forest flora of Ceylon. It is a very incomplete one, but with a wealth of species to choose from, it is difficult not to omit a number of characteristic ones. To this may be attributed any glaring omissions, as well as to the fact that the writer of this notice can in no way lay any claim to being considered anything botanically but an amateur.

INDIAN FORESTRY.

University, Edinburgh, August, 1900.

SIR,—The reference to Indian Forestry made in the London letter of your issue of 30th July opens a subject that should receive more notice at this time in view of its bearing upon famine in India. The following quotation conveys a world of meaning to the initiated:—"Lord Elgin corrected the one mistake of the Department, which carried out too stringently the rules for minor produce. Now the forest pastures and brushwood are thrown open to the people to preserve their cattle in time of famine, and the old jealousy between the district and the forest officers has ceased."

In the published account of my visit to India in 1887, while pointing out the great benefits to India of forest conservancy and urging its enormous extension on more rational lines, I was able to point to more than one mistake of the Department and also to give several excellent reasons why such mistakes were possible. I believed then, as now, "that the best interests of the Empire must suffer if the main object of the efforts of the Forest Department is reduced to the growth of forest trees." It is probably a little premature to assert that the Forest Depart-

ment has made but "one mistake" when it took about forty years to discover the mistake in question and to have it rectified. People must not jump to the conclusion that we have adopted the wisest course in connection with the whole forest area of India by following the German plan of management and thereby entirely discarding the natural condition of annual purification by fire under which all the great forests of India have been grown during past generations. Probably time may show even from a forestry point of view that it would have been better not to have had our eggs all in one basket. There are many weighty reasons from the agricultural standpoint (now that the culivator has had restored to him some of the privileges of which Government, while ill-advised, saw fit to deprive him) why certain forest areas as of old should be regularly purged by fire. The position is fully discussed in the chapter of Forestry in *Indian Agriculture;* and the late Dr. Cleghorn, who kindly read the proofs of that chapter, without assuming any responsibility for the statements it contains, declared that, if my views proved to be correct, very important changes might require to be made in the system of forest management in India. After a lapse of ten years one of the most important changes asked for has been given effect to. Whether other necessary alterations will be made and how long it may take for their accomplishment remain to be seen.

It was specially gratifying to see General Michael, writing on 2nd August, emphasise the credit due to the late Dr. Cleghorn for the very important part which he played in the establishment of scientific forestry in India, but no one mentioned the fact that General Michael himself may be justly described as the pioneer of Indian Forestry. The forestal condition of India to-day might have been in a sorry plight, indeed, but for the grasp which the then Lieutenant Michael, from the time of his appointment as a forest officer in 1848, took of the situation in Madras, and the great success which he achieved in saving what remained of the ancient forests of Southern India, which were being rapidly and wastefully destroyed. There is no gainsaying the fact that the so-called "benighted Presidency" gave origin to the Imperial Forestry Department for all India, which with all its defects has achieved so much, and General Michael (1848 to 1855), followed by Dr. Cleghorn in 1856, were the instruments used in the preliminary work which led to its formation and to the appointment of Sir (then Mr.) D. Brandis as Inspector-General in 1864. It is a significant fact that largely owing to the judicious way forest conservancy was introduced in Madras the absence of friction between the forest officers and the people has been a conspicuous feature of the forest management in that Presidency. The so-called "old jealousies" to which your correspondent refers were experienced further north, where forest conservation was introduced more on the cast-iron German system (now happily begun to be relaxed), which did not sufficiently respect and adjust itself to the interests of the agricultural community, and to which it was my painful duty to refer in writing in 1898, "that much of the valuable time of the Forestry Department is taken up in fighting the Agricultural Department."—I am, &c.

Robert Wallace.

August 15th, 1900.

ARTIFICIAL CHANGES OF PHYSICAL PROPERTIES OF SOIL.

(Continued).

Keeping in mind the great influence directly and indirectly exerted by the temperature of the soil upon the growth of plants, the practical agriculturist will endeavour to find means to modify the temperature according to the necessities of the plants. In colder climates, naturally efforts must be made to promote a rise in temperature, while in warmer regions it will often be necessary to proceed in the opposite direction. In what ways and to what extent the temperature of the soil may be influenced is briefly discussed below.

In the cultivation of plants which furnish products of high market value, such as vines, fruit trees, &c., and which require a rather high temperature, artificial changes in exposure or inclination (producing south-west, south or south-east exposure, or inclining the plane of growth more directly towards the south) may be of considerable benefit especially in cold climates. The method will, however, be productive of good results only when the soil contains sufficient moisture, because only in that case is the high temperature beneficial, and the increase in yeild sufficient to justify the outlay required to make the change. This method need not be restricted to hilly lands but can be applied to level soils. Roof-like elevations may be constructed with broad surfaces facing towards the south and rather narrow exposures towards the north. The former may be planted with crops that require considerable warmth, the latter may be renewed for grass or such other foliage as requires less heat. This method is not adopted to extensive field culture of crops furnishing products of comparatively low market value, both on account of the very unequal growth of the plants on the two opposite inclinations, and because the benefit derived even under favourable circumstances would not justify the outlay.

On hilly land in hot climates a reduction of temperature of the soil may be necessary on steep inclines facing the south, south-east or south-west, because under such conditions, not taking into account the fact that the moisture is generally insufficient for maximum crops, the temperature of the soil frequently exceeds the limits for the perfect development of plants. In such cases the construction of terraces offers special advantages, since by their means the temperature of the soil may be lowered and the moisture in the soil regulated in accordance with the needs of the plant. Another common method of altering the exposure of the soil consists in the construction of beds, running through the whole length of the field and separated from each other by furrows. The effect of this arrangement is to bring about a more rapid removal of water from surfaces of high water capacity, but, leaving out of account the fact that

this result may be accomplished by simple means (water furrows), the process in question has the disadvantage of producing unequal heating of two oppositely inclined surfaces, resulting in unequal growth of the plants on the two sides. For this reason bed culture is not suited to fields that are to be planted with only one kind of crop. In such cases level cultivation which secures a higher and more uniform temperature is decidedly preferable.

If, however, this method is followed the bed should run north and south if the field permits since the difference in temperature between the east and west slopes is far less marked than that of slopes facing north and south. In other words, the disadvantages of unequal heating is least with beds running north and south, an excellent means of raising the temperature of the soil in the cultivation of plants in ridges or in hills. Soils so cultivated have a higher average temperature during the growing season than those cultivated level. The effect is of longer duration in ridge culture than in hill culture, because in the former the ridges are constructed before seed time, while in the latter the hills are made in the more advanced stages of growth of plants. For this reason ridge culture is especially suited to plants which require a considerable amount of heat (maize, sunflower, beets, &c.,) in climates unfavourable, as regards temperature, to the growth of these plants. However, this is true only for regions in which the weather in spring is not too cold, for the plants growing on the top of the ridges are, on account of their exposed position, more easily injured by late frosts in spring than those planted on the level soil and hilled up later. As a general rule, both these methods are mainly adopted to such soils as have little capacity for collecting and retaining heat (clayey and calcareous soil), and which are also apt to collect excessive quantities of water. It is evident that the increase of temperature due to ridge or hill culture is of no advantage on soils of little water capacity and great permeability (sand) when precipitation is scanty. Under such conditions level culture is to be preferred. It should be remembered when ridge or hill culture is used that ridges running north and south are of higher and more uniform temperature than those running east and west. Regulation of the store of water is the soil is another means of modifying the temperature. If the soil is wet elevation of temperature is brought about by removal of the excess of moisture.

The proper means to this end are direct removal of water, lowering water capacity, and increasing permeability of the soil as already explained. That the desired result may be obtained by these means has been proved by various experiments. Another means of changing conditions of temperature in soils is intermixture with soils of opposite properties as regards heat. Admixture of sand with clay or earth rich in clay and limestone results under natural conditions in an average increase in the temperature of the soil, while the opposite process produces a lowering of the temprature of the soil. By thoroughly intermixing sand and humus a soil results which collects heat more rapidly and to a greater depth than is done by either separately. Increase of humus in mineral soils as, for instance, by the liberal application of manures of organic origin prevents extremes of temperature.